how to select physical record-keeping software for your farm computer

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How To Select Physical Record-Keeping Software For Your Farm Computer

Prepared by

Mark Olson
Management Technology Unit
George Malcher
Financial Management Section

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Alberta
AGRICULTURE
Farm Business Management Branch
Olds, Alberta

FOREWORD

Computers are efficient at collecting, categorizing and analyzing large amounts of data. Running a modern farm efficiently requires the gathering and analysis of information on many different measures, dates, applications and other important management material. To be able to perform this job with a computer, a farmer needs the right software.

In computer technology, software, or the programs that run the computers, are and will continue to be the key elements in harnessing the microcomputer as an effective management tool. Physical record-keeping software comes in a wide variety of programs; some specifically developed for agriculture and other more universally usable programs which were specifically adapted for agricultural applications.

This guide was developed to assist farmers to evaluate physical record-keeping software to find the program best suited to their purposes. In addition, 14 programs readily available in Western Canada were evaluated and are discussed in the guide.

The programs reviewed were versions available in the summer of 1984. Readers should note that some programs perform differently from computer to computer and that later revisions may alter program performance. Vendors should be contacted for the most up-to-date characteristics.

Computers are here to stay and help increase productivity. Making a good choice in selecting the right computer and program combination for your purposes will speed up the process.

J. Wilson Loree, P.Ag.
Head, Farm Business Management Branch
Olds, Alberta

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INTRODUCTION

Major advances in agricultural productivity and technology have largely by-passed the farm office. Here the note pad, pencil and calculator still rule supreme. However, microcomputers and agricultural oriented software have been available to farmers for several years now. The availability of relatively moderately priced computers has made possible the wider acceptance of electronic data processing by farmers. As a result, the pace of changing and modernizing the farm office has increased considerably.

As with every change in routine and practice, the costs and benefits of the change should be carefully examined. The cost side is easily established but the benefits are much harder to quantify. In the case of computers, returns usually do not come immediately or even soon after it has become part of the business routine. Initially, a computer will lead to more work, as new owners will usually have to take some time to get familiar with the new technology. In addition, farmers may try to increase the benefits from electronic data processing by calculating the outcomes of several possible scenarios and therefore they must make more time available for planning and control.

Computers are particularly suited to doing simple repetitive tasks very quickly and accurately. They are especially good at spotting problem situations, as for example in large livestock operations. But for computer use to be successful in your operation, you and your staff must be interested in what the computer can do and be prepared to put up with the problems and frustrations that will almost inevitably occur in getting the system up and running. This situation can clearly be improved by careful choice of a good program and matching hardware from companies supplying good instruction and providing good backup facilities.

If one had only a single use for an on-farm computer, the cost would be difficult to justify. Fortunately, most microcomputers can assist in performing a wide variety of management tasks; in addition to the record keeping functions discussed here, a computer can also be used for accounting, budgeting, word processing, etc. Most microcomputers can also be modified for use as terminals to communicate with and use programs from other computers.

In contemplating using a computer for keeping and analyzing your physical records, try to find a system that is fairly close to the one you are using now. The problems involved in converting to a computer system will be minimized if you don't also try to change record-keeping procedures at the same time. A novice to electronic data processing will have to spend from three to nine months learning to use the computer. You can speed up the process by joining a computer user group in your area.

Should you be contemplating buying a computer, do some serious studying, shop around, read as much as you can about computers and if possible, consult other farmers who already own one. When you have absorbed as much knowledge as you deem necessary to make a purchase, then go ahead and buy one. When buying a small computer software and hardware package **DON'T**

- Buy backward — never buy first and ask questions later
- Get an inadequate contract — get it in writing
- Miss testing the equipment — run it first
- Buy blind — consider all alternatives
- Have unrealistic expectations
- Ignore hidden costs — is a printer, monitor, etc. included?
- Buy a dead-end machine — look for the possibility of expansion in the future
- Buy for the wrong reasons — know exactly what you want the machine to be able to do before you buy one.

Microcomputer technology is new, with advances in hardware of software occurring at a rapid pace. Some of the programs discussed will be replaced by newer, better versions in a very short time. Nonetheless, the packages reviewed here will offer the user at least some if not a considerable number of improvements over most manual systems.

The reader should consider the programs discussed here only as a rough approximation of what is on the market now. New programs will appear rapidly and if you follow the evaluation process outlined in this publication, you should be able to make a satisfactory choice of other programs available from software dealers.

SELECTING A PHYSICAL RECORD-KEEPING PROGRAM

Determining which of the many software packages available will be best for your farm operation is a formidable task, one which is complicated greatly by the new terminology and new concepts which must be mastered in dealing with computer systems. To aid in making an intelligent purchasing decision, the buyer must organize and classify the many aspects of a product's performance. This can be accomplished in five major steps:

1 — Determine your reasons for wanting a new record-keeping system.

2 — Determine the minimum requirements the software package must have to be considered.

3 — Determine how many programs are available for your requirements.

4 — Delete the programs which do not meet your minimum requirements.

5 — Select the best program remaining.

An interest in alternative record-keeping systems indicates a dissatisfaction with one's current record-keeping methods. The first step in selecting a program is to identify what specific areas of your record system you are dissatisfied with, and what improvements you would have to realize in order to justify the cost and time of acquiring a computerized system. Try to be reasonable in determining the goals your new system should meet. No program will provide all of the services you might want, therefore, simply list those improvements you would like to see to justify the purchase of a computerized record-keeping program.

The second step in selecting a package is to determine what program features will be necessary to achieve the goals you have set out for your new system. This step and the next one are where knowledge about records management and computer systems becomes essential. Use the program evaluation criteria as a guide as to what features are available in programs and what areas of the system's operation must be considered. The farm business management branch or your local regional farm economist can be of particular assistance with this step of your program selection.

Now that you have determined the necessary requirements for the software packages you may be considering, lay them aside for the moment and determine what programs are available. There are two factors which determine whether or not you may use a particular program: location of a supplier and hardware requirements. It would be ideal if you could purchase your program directly from a manufacturer located 20 miles away. The more distant from your supplier you are willing to be, the more programs there will be available to select from, but correcting problems with a distant dealer will be more difficult than with a local dealer.

To solve problems relating to hardware compatibility, a good knowledge of computers is required. A good software or hardware dealer will be of great assistance in determining whether or not a program is compatible with your system. Be sure when trying to determine compatibility to consider the peripherals as well as the main computer, i.e., disk storage capacity and the capacity of the printer. The use of a "standard" operating system such as CP/M will greatly increase the number of programs available. It is usually wise to test whenever there is any question of program compatibility, rather than trust sales literature.

The fourth step is to eliminate all of the programs which do not meet the minimum requirements set out in the first two steps. This process can be difficult, since some programs use different names for the same procedure so that they appear not to have a certain feature, while in other cases a program will claim to have a feature when in actual fact it is so limited or awkward as to be useless. At this point it may be helpful to make a check list of your minimum requirements to ensure that each program gets examined on each point.

Once you have eliminated all of the programs which do not meet your minimum requirements, most of your work should be completed. If one program remains, then you needn't proceed further. If no programs remain, then there are two choices available: either relax your minimum requirements until at least one program is acceptable, or wait until a new program comes along which does meet your minimum requirements.

In most cases there will be several programs still under consideration at this point. Since all of these programs will prove more or less satisfactory, you can now choose from among them on the basis of cost and additional features. If no particular program stands out, it may be of some assistance to establish a weighted decision table to select from the remaining programs. For example, take the following table:

Program: Feature	Weight	A	B	C	D
Ease of use	0.4	5	4	8	1
Speed	0.2	2	7	3	8
Expandability	0.2	2	4	5	9
Dealer support	0.2	3	2	1	4
Total score:		3.4	4.2	5.0	4.6

Each program is given a score between one and ten for each feature, one being poorest and ten being the best. The weighting for each feature indicates the relative importance of that feature. The total of all weightings should be one in order to obtain a total score between one and ten. The total score for each program is obtained by multiplying each program's rating for each feature by the appropriate weighting and adding the results. In this example, program "C" would be the best choice.

Making an informed choice from among the many different programs available is not an easy task, and one which will take a substantial amount of time. However, the time spent in making a correct purchase the first time is nothing compared to the time lost if you have to establish a new system because the first program purchased was unsatisfactory.

EVALUATION CRITERIA

Before you can begin comparing different computer programs it is necessary to establish a set of criteria, so that each program is evaluated according to its individual merit as compared to the other programs available, rather than through first impressions or a sales pitch. A well defined set of criteria is vital in evaluating a program's performance. We have divided our criteria into two parts. The first set of criteria are concerned with general characteristics for all computer programs, regardless of their intended use. They could be applied equally well to spreadsheets, word processors, accounting programs or any other type of software. The second set involves features which are of concern when considering physical record-keeping systems specifically.

Program evaluation criteria — general

FRIENDLINESS

- User Documentation:
  - What types of documentation are present?
  - Are tutorial, alphabetic reference, quick reference, etc. sections included?
  - Manual quality:
    - Quality and number of illustrations
    - Type of binding
- Error Correction Methods:
  - How are typing errors corrected?
  - How are errors in the disk records corrected?
- Menu and/or On-Line Documentation:
  - Do the menus and documentation cover all parts of the program's operation?
  - Is there a facility for by-passing unwanted menus?
  - Is on-line help provided?
- Commands Used:
  - Are the program commands easy to remember and use?

SECURITY

- Response to Operator Errors:
  - Keyboard errors:
    - What happens when control keys, the break key, etc. are hit by accident?
  - Is a printer not ready detected?
  - How is a wrong disk insertion handled?
- Error checks:
  - Is all input checked to be in range and reasonable?
  - Is substitution of numbers for character data, and characters for numbers handled well?
- Backup procedures:
  - Is there provision for data backup?
  - Can the program be backed up?
- Data security:
  - Is a password system included?
    - How useful is it?
    - Is there provision for recovery from forgotten passwords?

INPUT OF DATA

- What editing facilities are provided?
- Is the use of upper and lower case supported?
- How well are the input forms laid out?
- Is there any uniformity among the input forms?

OUTPUT OF DATA

- Ease of interpretation:
  - Are all explanations contained in the reports?
  - Are clear, non-technical titles used?
- Is there uniformity among forms of similar types?
- Output abilities:
  - Are reports easily reformatted?
  - Is the program's output available on screen, printer, disk, etc.?

EFFICIENCY

- Response time:
  - What is the input response time?
  - How much time is required to generate reports?
- What number of disk accesses are required?

INTEGRATION

- What other programs can this one be integrated with?
- Is the format of the records on disk available?

HARDWARE REQUIREMENTS

- What basic hardware is required?
- Is any extra hardware/software required?

MAINTENANCE

- Is any technical documentation provided?
- Level of dealer support:
  - Is a direct telephone number to the dealer/manufacturer provided?
  - Where is the dealer/manufacturer located?
  - What is the potential stability of the dealer?
  - What is the program's update policy?
  - Is any training provided?
- Is the source code available to the end user?
- What is required to modify the program?
  - Was an interpreted (built-in) or a compiled (machine) language used?
  - What original language was used?
  - Is any additional software required to modify the program?

LICENCE REQUIREMENTS

CAPACITY

COST

Explanation of general criteria:

FRIENDLINESS describes the effectiveness with which a program interacts with its user. A good program is immediately comfortable to use, while a badly designed program will never be easy to use despite the owner's best efforts to learn how. A system should be obvious enough and helpful enough so that it can be effectively run without spending an inordinate amount of time learning how to use it. Good documentation is important to friendliness, both in the manual and in the program. Documentation must at the same time provide an easy learning environment for the new user, as well as a quick source of information to the advanced user. As well, commands for the various program functions should be clear, straightforward, and easy to remember. Obscure codes, numbers and instructions should be avoided. As humans must operate the program, errors should be quickly and easily correctable. Since the success of any computer system is dependent on the information placed in it by its user, no aspect of a program's operation is more important than the ease with which it may be used.

SECURITY refers to the safety of information entrusted to the computer system. Important records stored on a floppy disk are valuable and fragile. While no program can protect the user from power or hardware failure, or poor disk handling practices, it should protect the data from all forms of reasonable human error or abuse. This includes provisions for things like keyboard errors (e.g. accidentally striking function or break keys), printers which are not ready, and the insertion of wrong disks into the machine. As well, the program should be able to handle invalid or incorrect inputs, and should detect badly formatted or impossible values for immediate correction. There must be provisions for backing up both data and the original program at regular intervals. Some systems provide for passwords to control access to the program and to the farm data. The usefulness of these systems is debatable, especially when removable diskettes are used, since in many cases the passwords are easily broken or gotten around. A solid, locked drawer or a good hiding place is often a more secure arrangement than relying on a poorly made password system.

INPUT OF DATA refers to how information is put into the program. Good software will ensure that users are constantly aware of what is expected of them, and what function each input serves. When considering input of data, look at how well the computer can edit the input data, the layout of the input screens used, and the degree of uniformity among the various input screens used.

OUTPUT OF DATA refers to the usefulness of the reports and information returned to the user by the system. The reports generated should be easy to use and interpret, meaning that each report should be self-explanatory and must include clear, non-technical titles. All reports should be as uniform in layout as possible among those of a similar type. A good system will also allow the user to obtain his reports in whatever medium desired: printed, on the screen, or on diskette. Printed output is used whenever a permanent copy of the computer's output is required — either for filing or for assistance in correcting errors. The screen is used whenever quick output is required for reference or short-term operations. Sending the output of an operation to disk file is done whenever it may be convenient to use that output in another program, for example in a word processor. Saving output to disk is a simple to implement, useful feature that most programs lack.

EFFICIENCY refers to the program's ability to deal with an increasing amount of input. A program advertised as being able to handle 1000 accounts is of little use if it requires an hour to access each one. Most microcomputers are at the limit of their processing power when handling a medium to large size farm's records, and if this is not compensated for, can result in long delays especially when floppy disks are being used. In considering efficiency, two "times" are of interest. One is the "response time", which is the time required after each entry is completed before the system is ready for another entry or command. The other is the amount of time required to generate reports. Affecting both of these times is the number of disk accesses required. A program which accesses the disk drive rarely will be fast, but will usually have a limited capacity because of the amount of data which will have to be stored in memory at one time. A program which accesses the disk often will be slower, but will generally have a greater storage capacity.

INTEGRATION refers to whether or not the records of one program can be used with another similar program. For example, can records within an accounting program be used as input for a spreadsheet program (e.g. Visicalc) for planning purposes. Such an ability is a recent innovation in the software market for microcomputers, and usually exists only within "families" of software from a single manufacturer. However, if the program can be made to save its records in a useful format (e.g. DIF format, or a simple ASCII file) on diskette, then a wide range of possibilities exists for other programs to use the records with a little programming.

HARDWARE REQUIREMENTS refer to the minimum size and capacity of a computer system required to effectively use the program, including any extra equipment or software required, either as dictated by the manufacturer or by testing, whichever is greater.

Contrary to popular belief, a large computer program, like any other piece of equipment, requires *MAINTENANCE*. While a program does not suffer wear like a machine does, other problems do arise with time. Errors are found in the program, new features are added, tax laws change requiring new information and so on. In addition, as experience grows with the program, users may find features which they would like to have added, either by themselves or by a hired programmer. A program which doesn't allow for these changes will be of less value than one which is easily modified and updated. Factors that contribute to maintainability are the amount of documentation available on the program's organization and the degree of dealer support. A good dealer will be experienced with the program and will provide for help quickly, either by providing a direct telephone number or local help. The dealer should also be reputable, with good prospects for stability. It is through the dealer that any updates or revisions for the program will be received, therefore, the dealer's and manufacturer's update policy is important. For the more advanced user (i.e. those who can do their own programming), the availability of the source code (the name of a computer program while it is still human readable, before it is converted into being machine readable) and the hardware and software requirements for modifying the program, are considered to be part of maintenance.

When considering purchasing a program, the terms of the *SOFTWARE LICENCE* are often neglected. It is the software licence which usually spells out the rights and responsibilities of the manufacturer and user. Also in the software licence are the terms governing use of the program, including the purchasers' rights to copy or modify it. Before purchasing any computer program, make sure that the terms of the licence agreement are workable for both parties.

The final two general criteria for each program are the *MAXIMUM CAPACITY* of the program, as well as the standard or average *COST*.

Program Evaluation Criteria — Physical Record Systems

Because of the differences in the industries in which they are intended to be used, five different sets of criteria are necessary for evaluating the physical record-keeping programs examined. A separate set of criteria have been established for cow/calf herd, field crop, dairy herd, feedlot, and swine herd management programs.

COW/CALF HERD MANAGEMENT PROGRAMS

ANIMAL IDENTIFICATION

Are cows/calves identified by a name or number?

Can a physical description of the animal be recorded?

Is the location and/or a group ID available?

Is the birth date or age of the animal recorded?

How is the breed entered?

Is the original source and final disposal of the animal recorded?

Are the sire and dam of the cow recorded?

BREEDING RECORDS

At breeding, are these items recorded:
- date bred or put to bull
- bull used
- number of cows per bull

For each pregnancy check performed:
- Can the program predict the date required?
- How is the result of the test recorded?

Is the expected date due to calf determined?

At calving are these items recorded:
- the date and time
- sex of the calf
- final disposal of calf

PRODUCTION RECORDS

What measures of cow performance are performed:
- weaning percentages (calves weaned/calves born or calves weaned/cows exposed)
- calving ease
- cow efficiency (average weight weaned/number of cows exposed or weight weaned/weight of calf)

What records of bull performance are used:
- breeding success
- semen evaluation scores
- general condition

How is the calves' performance measured?
- Are the birth weights and weaning weights recorded?
- How is rate of gain measured?
- Are health problems recorded?
- Is calf efficiency measured?

What cow health records are maintained:
- emergency treatments (bloating, injuries, etc.)
- other health procedures (vaccinations, etc.)
- death loss and causes
- general condition

REPORTS

Is average cow performance measured?

Can cows be ranked by performance?

Is the total and average cost per animal and per lb. production available for:
- feed
- labor
- health
- capital
- other expenses

Are time and facility scheduling reports provided?

What other reports are available?

The main function that the cow/calf operator will want to get from a management system is an accurate method of determining future production based on the cows' previous performance and genetic potential. By determining which of the animals are exceptional producers and which are not up to par, and by basing the culling and breeding program on this information, the manager can get the herd to perform at its maximum.

In general, with beef herd programs each individual animal must be identified in some way. Most programs use a single tattoo or ear tag number as the main identification method, with provision usually made to store additional names or numbers for breed identifications, etc. A physical description of each animal is often not provided for. This is unfortunate; if it becomes necessary to search through a pen of cattle for the one with tag number AH201, it simplifies things to at least know that you are looking for a red white-face. For larger operators, it is often necessary to divide the herd into sub groups; in these cases some method of indicating which group the animal belongs to is important.

Each cow's breeding records contain information which deals with the animal's reproductive cycle. When bred, which bull bred to, date of calving, etc. should all be recorded here. This section of the program should give the manager assistance in scheduling and completing time sensitive operations. The program should track each animal which requires special handling (e.g., AI, embryo transfers) and keep the herd operator up-to-date on which animals require attention.

The maintenance of production records is where the program pays its way. The program should allow for the recording of all aspects of production performance, not only the weight of the calves weaned but the feed consumed in doing so, the amount of handling and labor the cow required, any exceptional problems encountered and total cost incurred. Good software will allow you to analyze the records that the program has collected in whatever way is of most use to you. When using cow scoring or rating systems that are built into programs, be sure that what is being measured by these values reflects accurately the value of the animal to your operation.

CROP MANAGEMENT PROGRAMS

FIELD IDENTIFICATION

What type of field name or numbers are used?

How is the field's location recorded?
- Is a legal description used?
- Is any other description of location available?

How is the size of each field entered?
- Is there a separate entry for cultivated, waste, and other acreage?

Can a general description of the field be recorded?

Is the owner of rented land identified?

OPERATIONS RECORD

When tilling is performed what is recorded:
- the date
- operation performed
- machine used
- hours spent

What information is maintained for fertilizer application?

What soil analysis results are recorded:
- the date
- recommendations from the analysis

What is entered when fertilizer applications are performed:
- the date
- method of application

What amount of
- nitrogen
- phosphorus
- potassium
- other nutrients were applied?

What is included in the record that is made when seeding is completed:
- the date
- hours required to complete
- seed variety used
- seeding rate
- seeding depth
- any seed treatments used
- fertilizer applied with seed
- seed bed condition

What is included in the pesticide application records:
- date and time of application
- type of pesticide applied
- method of application used
- rate of application
- weather conditions at time of application
- field conditions
- effectiveness
- other general comments

What can be entered when harvesting is completed:
- date and time
- machine and settings used
- hours required
- yield
- storage location or disposal of harvested crop

REPORTS

Is the total yield of all crops available?

Can the average yield per acre be calculated?

Is the average cost per acre available for:
- seeding
- tillage operations
- fertilizer
- pesticides
- harvesting
- land costs or rent
- capital costs
- other costs

Can the average income per acre be calculated?

Is the average profit or loss per acre found?

How is implement utilization measured?

Are field histories maintained?

What other reports are available?

In any management system which involves livestock, the major emphasis is production improvement through encouraging the inheritance of desirable traits. This is not the case in crop management, where any increases in production or profitability will come only through improved crop practices. Because of this, crop systems must necessarily deal with a much longer time scale than other programs since, while a change in practices in animal handling will result in an observable change in a very short time (several days or weeks), the result of any change in crop practices can only be observed at year-end when the harvest is completed. Be wary of any crop management program which has not made provision for the recording, comparison and analysis of data stretching over many years (even decades). Anything less is just a glorified inventory program.

Each field must be identified with the program somehow, either with a name, code or number. The identification system should be easy to use and remember. Provision should be made to record the location and description of the field in detail.

The operations record is a detailed log of all of the work that has been performed on each field. It is vital that you can record very detailed information, so that next year or even five years after the crop has been grown, you can use these records to try to determine exactly which field operations have been most successful in increasing production, and which have not been helpful. Things like weather and soil condition not only influence the growth of the crop but the effectiveness of the fertilizer and pesticides applied, and must be recorded if any sort of accurate analysis is to be made of their effectiveness.

Most programs are not able to determine the costs of crop production. This is an unfortunate result of the fact that there is currently little integration between the financial and physical aspects of production. The program should at least be able to provide a flexible and thorough analysis of the yields achieved in relation to the inputs made.

DAIRY MANAGEMENT SYSTEMS

ANIMAL IDENTIFICATION

Are individual cows identified by a name or number?
How is the animal's breed recorded?
Can a physical description of the animal be entered?
Is space provided for N.I.P. or breed registration numbers?
Is the cow's location and/or string recorded?
Is the cow's birth date or age used?
How is the animal's origin and final disposal handled?
Can the cow's sire and dam be identified?

BREEDING RECORDS

Are expected heat dates estimated?
Can the dates bred and bull used be maintained?
Are the date due and result of pregnancy checks available?
Are drying-off dates estimated?
What is included in the calving record:
- date and time
- sex of calf
- final status or disposal of calf

PRODUCTION RECORDS

Is milk production recorded daily or are the results of occasional tests used?
Does the gross production measures include:
- amount of milk
- fat/percent fat

Are breed class average ratings calculated for:
- amount of milk
- fat/percent fat

Is 305 day production calculated for:
- amount of milk
- fat/percent fat

Are somatic cell counts maintained?
What non-fat solids measures are used?
Are any other production measurements taken?
Is feed intake recorded?

HEALTH RECORDS

How are scheduled procedures (vaccinations, vitamins, etc.) recorded?
Is a record made of emergency treatments?
Can the general condition of the animal be scored?

REPORTS

Can cows in the herd be ranked by:
- herd average
- breed class average
- 305 day production
- other criteria

Is the deviation available of each animal from the:
- herd average
- breed class average

Can the total and average cost per animal and per unit production be printed for?
- feed
- labor
- health
- capital
- other costs

Are time and facility management action lists available?

What other reports are provided?

OTHER FEATURES

Are ration preparation and mixing programs provided?

Is there support for on-farm semen inventory maintenance and ova transfers?

Dairy management programs are easily the most complicated and involved of the physical record-keeping programs available. The high cost of dairy cattle feed and the sensitivity of the cow's production to changes in that feed combine to make the dairy cow probably the agricultural production element which responds most drastically to changes in management practices. When the complications added by the quota system (which requires that production remain as constant as possible in the face of changing herd makeup, illness and other factors) are added, it becomes apparent why dairy programs need be as complicated as they generally are.

The dairy herd is so closely monitored that a great deal of information is required for each individual animal. Besides a main identifying name or tag number, a breed description is necessary and usually some sort of physical description. For most operations a breed registration number will be required. Most large dairies divide their operation into separate strings; for them a string or group ID will be important.

Keeping the milk cow in production for as long as possible requires careful monitoring of the breeding and calving process. As each cow passes through the breeding, dry off, calving and milking cycle it should be carefully tracked by the software and the operator informed whenever a particular cow requires attention. By keeping the herd manager up-to-date on heats due, pregnancy checks required, etc., the dairy management program should help to keep unproductive days to a minimum.

Production records are where the results of management changes and breeding and culling programs show up. When choosing and running a dairy program, the timeliness and effort required for daily milk recordings must be balanced against the less accurate but more common use of weekly or monthly test results. One of the great potentials of computer management systems is the use of automated milk weighing and feed control systems in conjunction with computerized record-keeping. When milking statistics can be collected automatically and continuously, there is great potential for improving herd management while reducing the labor burden on the operator. Anyone considering the purchase of a dairy management program should look for a system which will be able to adapt to this automated technology when it becomes available.

There are many different reports which could be of use to the dairyman. Purchasers of one of these programs should look for reports which provide the information which is of particular interest and value. Ideally, the system should provide for user-defined report, so that the operator can narrow-in specifically on what is required. Particular attention should be paid to the action reports produced by the program (cows due to dry off, cows due to breed, etc.) since these will probably be used the most often and must be quick and easy to understand so that the animals which require it get prompt attention.

FEEDLOT MANAGEMENT SYSTEMS

ANIMAL IDENTIFICATION

Are lot names or numbers used?

How is the animal's location and/or pen number recorded?

Is the lot's owner available?

Is each animal's date into and out of the feedlot recorded?

PRODUCTION RECORDS

How are the animals' weights into and out of the feedlot recorded?

Is the amount of feed consumed recorded?

How are yardage costs entered?

Are health/veterinary costs maintained?

FEED RECORDS

Does the program provide support for ration formulation and/or mixing?

Is an inventory maintained for feed ingredients?

Can the program provide automatic pricing and billing?

REPORTS

Are billing and inventory reports provided?
Can animals be ranked by performance?
Is the total and average cost per animal and per pound gain available for:
- — feed
- — labor
- — health
- — capital

Are time and facility management action lists supplied?
What other reports are included?

Feedlot management programs tend to be more concerned with the inventory and record-keeping aspects of the operation than with improvements in physical production. This is probably because of the five types of farm operation for which we have reviewed software, feeding is probably the most demanding in terms of the basic record-keeping required. In the process of being fattened, an animal will have to be handled several times, may be moved around among several different pens, can become sick, will be fed several different rations and may be involved in any number of unforeseen circumstances. To track a lot of cattle through this complex process and at the same time produce accurate and timely information is a real challenge.

Most feedlot programs will reflect the standard lot and pen organization used by the majority of feedlots. Although organizing the cattle being fed into lots greatly reduces the amount of information which must be stored as opposed to recording each animal individually, it is very important that the program provide some method to split up the lot if it becomes necessary owing to different feeding requirements, illness, etc. Each lot will usually have an identifying name or number and a current location or pen. It is fairly standard that the owner of each individual lot be identified in the main lot record.

Most of the operations of the program will take place in the production records. Here, one records the weights of the animals when they enter and leave the feedlot, the feed consumed, yardage accumulated, as well as any exceptional expenses (medication, bedding) charged to the lot. Since the information recorded here is used to determine the amount each customer is charged, it is important that it be detailed and accurate.

Pricing feeds is a very important aspect of feedlot packages. Automatic pricing of the rations fed and automatically charging the owners of the cattle accordingly, allows more accurate tracking of feed costs while reducing the time needed to perform these operations. The program should also include a good feedstock and veterinary supply inventory. Some programs also assist with ration formulation. Caution must be exercised when using these programs; they should not be used without a solid understanding of basic animal nutrition.

Billing is one of the most useful functions of a feedlot package. Ideally, the program should be able to produce a finished invoice which can be simply signed, stuffed in an envelope and mailed to the customer. The program should be capable of printing accurate, detailed inventory reports to keep you up-to-date on quantities on hand.

Other reports produced by feedlot programs generally deal with the productivity and profitability of the feedlot. The system should be able to produce easy to understand reports that include the information of interest to the operator. Action reports are very helpful in scheduling time and facilities by letting the manager know in advance what will be required.

SWINE MANAGEMENT SYSTEMS

ANIMAL IDENTIFICATION

Are sow names and/or numbers used?
Can a physical description of the animal be included?
Is the location of the animal kept?
Is the birth date or age of the pig used?
How is the breed composition recorded?
Can the source and disposal of the animal be maintained?
Are the sire and dam identities available?

BREEDING RECORDS

Does the program predict heats due?
Are the dates bred and the boar(s) used recorded?
Are the dates due the results of all pregnancy tests recorded?
Is the date due to farrow predicted?

PRODUCTION RECORDS

FARROWING

Which of these values are recorded for each litter:
- — number of each sex
- — number of piglets born alive
- — number born dead

- — number weaned
- — number finished

Are the average and total weights at birth and at weaning available?

FEEDING

Is the date in and weight when entering the feedbarn recorded?

Is the date out and final fed weight recorded?

Are backfat measurements maintained?

Is feed consumption recorded?

HEALTH RECORDS

Can emergency or veterinary treatments be entered?

Are other health procedures (immunization, vitamins, etc.) recorded?

Is there a position for recording general health?

REPORTS

Is the average performance of all animals available?

Can the sows be ranked by performance?

Are herd management action lists provided?

Is the total and average cost per animal and per unit production available for:

- — feed
- — labor
- — health
- — capital

Are any other reports provided?

As in a cow/calf operation, the swine management program must keep records on each individual sow and gilt in the herd. A main name or number is generally used to identify each animal, with provision usually made to record an additional identification tag or number, the animal's birth date or age and some indication of its breed composition. Better swine packages also maintain a record of the animal's origin and final disposal and some sort of physical description.

The efficiency of a farrowing operation is in large part determined by how quickly after farrowing the sow is successfully bred again. This requires close monitoring of the reproductive cycle of each sow, which becomes complicated as herd size increases. The swine package should be able to predict the heats, breedings, pregnancy checks, farrowings due and give the herd manager advance notice as to when a pig will require attention.

The production records form the basis for measuring the potential of each sow. Exhaustive records should be available during and immediately after farrowing in order to try to determine the cause of piglet loss and reduce it. Litter weights taken at birth, weaning, before and after feeding, and the feed which has been consumed in the process provide the basis for determining profitability and suggest ways to improve herd management.

The program should produce a wide range of reports which can be narrowed down to include the information of interest to each individual manager. It should be possible to rank the animals in the herd in order to separate the superior animals from those which should be culled. Because of the intense management required with the swine herd, action reports are of particular importance. Which members of the herd require attention should be determined easily and reliably. Finally, the program should be able to produce detailed breakdowns of the costs of the operation.

SUMMARY TABLES

The following tables provide a quick summary of the features offered by each program. They are not exhaustive, and include only those features which are of particular importance and which may be directly compared between different programs. In all three tables the products are listed in alphabetical order. Please refer to the full reviews before selecting any particular program.

The following abbreviations and indicators are used:

* — indicates that the program has the features indicated
L — indicates that the program has the feature indicated, but it is limited in either usefulness or function
? — the information was either not supplied or is not available
Y — Yes
N — No
O — Optional

Program name		Advanced Ag Software Swine Breeding Herd Management	Aggro Dairy Herd Mgmt. System	Agri Mgmt. Services Inc. Poultry Package	Basic Business Systems Crop, Land Commodity Programs	Countryside Data Beef Cow/calf Herd Manager	Countryside Data Hog Management	Cutlass Herd Mgmt. System
Manual	Is a tutorial section included	*				*	*	*
	Is a quick reference section included	*						
	Is a technical reference section included							
	Are all input screens illustrated	*		L	*	*	*	*
Program control	Are menus used for program selection	*	L	*	*	*	*	*
	Is there a facility to bypass menu levels							
	Is on-line help available					*		
	Are the commands used mnemonic					L		*
Program tolerance to errors	Is protection from typing errors provided		*		*	*		*
	Is an off-line printer detected		*	?				
	Is a wrong disk inserted detected	*	*		*	*	*	*
	Is a disk drive not ready detected	*	*		*	*	*	*
	Is all input checked for errors where possible	*	*		*		*	*
	Is confusion of character & numeric data handled well	*	*		*	*	*	*
Backup facilities	Is there a built-in data backup program	*						*
	Are the programs copy protected	Y	Y	N	N	N	N	Y
Data security	Is a password system used							
Data input	Can prior fields be accessed at any time				*	*	*	
	Are upper and lower case characters used	*	L	*	*	*		*
Data output availability	Are all reports available on the screen	*		*	*	*	*	
	Are all reports available on the printer	*	*	*	*	*	*	
	Are all reports available on disk file							
Integration	Are there other programs available which share data				L			
	Is the format of the disk records provided				*			
Support	Is there a dealer/manufacturer in Alberta			*		*	*	*
	Is a service phone number provided	*	*	*	*	*	*	*
	Is training provided							*
Maintenance	Is the program modifiable by the user				*			
	Are program updates provided		*	?		L	L	*
Hardware	Apple II	*						*
	Commodore 64 and 8000 Series Computers				*			
	CP/M-80 Operating System Computers			*		*	*	
	CP/M-86 Operating System Computers					*	*	
	IBM Personal Computer	*		*	*			*
	MS-DOS Computers	*		*	*			
	TRS-80 Model III		*					*
	UCSD-p Operating System Computers							*
	Vector 4							
Cost:		$795	$1,200	$1,700	$500	$550	$550	$1,495
Page number for full report:		17	21	25	27	31	34	38

The following abbreviations and indicators are used:

*** — indicates that the program has the features indicated**
L — indicates that the program has the feature indicated, but it is limited in either usefulness or function
? — the information was either not supplied or is not available
Y — Yes
N — No
O — Optional

Program name		Dawson, Dau & Assoc. Feedlot Mgmt. Program	Homestead Beef Herd Record Keeping Module	Homestead Crop Record Keeping Module	Homestead Dairy Herd Mgmt. System	Homestead Feedlot Record Keeping Module	Marshalls Dairy Mgmt. 5-S	Solutions Cattle Admin. Program
Manual	Is a tutorial section included	L						
	Is a quick reference section included							
	Is a technical reference section included							
	Are all input screens illustrated			*	*	*	*	
Program control	Are menus used for program selection	*	*	*	*	*	*	*
	Is there a facility to bypass menu levels							
	Is on-line help available			L		L	*	
	Are the commands used mnemonic	*						*
Program tolerance to errors	Is protection from typing errors provided	*	*			*		
	Is an off-line printer detected							
	Is a wrong disk inserted detected		*	*		*		*
	Is a disk drive not ready detected							*
	Is all input checked for errors where possible	*	*	*	*		*	*
	Is confusion of character & numeric data handled well	*	*	*	*	*	*	*
Backup facilities	Is there a built-in data backup program							*
	Are the programs copy protected	N	N	N	N	N	N	N
Data security	Is a password system used		0	0	0	0		
Data input	Can prior fields be accessed at any time		*	L	*	L		
	Are upper and lower case characters used	L	L	*	*	L		L
Data output availability	Are all reports available on the screen	*	*	*	*	*		
	Are all reports available on the printer	*	*	*	*	*	*	
	Are all reports available on disk file							
Integration	Are there other programs available which share data			L		L		
	Is the format of the disk records provided							*
Support	Is there a dealer/manufacturer in Alberta	*	*	*	*	*	*	*
	Is a service phone number provided	*	*	*	*	*	*	*
	Is training provided		*	*	*	*		*
Maintenance	Is the program modifiable by the user							*
	Are program updates provided		*	*	*	*	L	
Hardware	Apple II	*					*	*
	Commodore 64 and 8000 Series Computers							*
	CP/M-80 Operating System Computers							*
	CP/M-86 Operating System Computers							
	IBM Personal Computer		*	*	*	*	*	*
	MS-DOS Computers							*
	TRS-80 Model III						*	*
	UCSD-p Operating System Computers							
	Vector 4		*	*	*	*		
Cost:		$500	$1,000	$1,000	$2,500	$1,000	$1,150	$1,890
Page number for full report:		42	45	48	51	55	58	63

Program name		Aggro Dairy Herd Management System	Basic Business Systems Crop, Land, Commodity Programs	Countryside Data Beef Cow/calf Herd Manager	Cutlass Herd Management System	Homestead Beef Herd Record Keeping Module	Homestead Crop Record Keeping Module	Homestead Dairy Herd Management System	Marshalls Dairy Management 5-8
Cow/Calf Management Programs									
Animal identification	Is a physical description of the animal included				L	L			
	Is a location or sub-herd ID recorded					•			
	Is the breed of the animal maintained			•	•				
	Is the source and disposal of the cow recorded			•	•				
Breeding records	Is there provision to handle pregnancy checks				•				
	Is the date due to calf predicted								
Production records	Can cows be scored by their calves productivity			•	•				
	Are cow/calf health records maintained				•				
Reports	Are animal rankings by performance provided			•	•	•			
	Are time/labour management (action) reports provided								
Crop Management Programs									
Field identification	Is a detailed description of each field provided		•						
Operations record	Is the time required for each operation recorded								
	Is the acreage involved in each operation recorded		•						
	Is the cost of each operation recorded		•				•		
	Are weather and soil conditions recorded if necessary								
Reports	Are costs adequately broken down into categories		•				•		
	Is a detailed field history provided								
Dairy Management Programs									
Animal identification	Is a physical description of the animal included								
	Is a location or string information recorded							•	•
	Is the breed of the animal maintained							•	
	Is the source and disposal of the cow recorded	•							•
	Can a breed registration or N.I.P. number be recorded	•						•	
Breeding records	Are expected heats predicted	•						•	•
	Is there provision to handle pregnancy checks	•						•	•
Production records	Are daily milkings recorded								•
	Are breed class average ratings calculated	•							
	Is 305 day production calculated	•						•	•
Health records	Is an animal health record maintained	•						•	•
Reports	Can the animals be ranked by their performance							•	•
	Are deviations from herd average available	•						•	
	Can costs be adequately broken down								L

Program name		Advanced Ag Software Swine Breeding Herd Management	Countryside Data Hog Management	Dawson, Dan and Assoc. Feedlot Management Program	Homestead Feedlot Record Keeping Module	Solutions Cattle Admin. Program
Feedlot Management Programs						
Animal identification	Can lots be split among different pens			•	•	•
	Can a lot be split up after initial setup			•	•	•
	Is an owner recorded for each lot			•		•
Production records	Are yardage costs calculated automatically			•		
	Are veterinary expenses recorded			•	•	•
Reports	Are billing reports provided			•		•
	Are ready-to mail invoices provided					L
	Are productivity measuring reports supplied			•	L	•
	Are costs adequately broken down			•		•
Swine Management Programs						
Animal identification	Is a description of each animal provided					
	Is a location and/or sub-herd maintained	•				
	Is the breed of each animal recorded		•			
	Can the source and disposal of each animal be entered					
Breeding records	Are expected heat dates predicted	•	•			
Data input	Is there provision to handle pregnancy checks	•	•			
	Is the expected farrowing date predicted	•	•			
Production records	Are the initial piglets born alive, dead, etc. recorded	•	•			
	Is piglet loss adequately tracked		•			
	Are birth and weaning weights recorded	•	•			
Feeding	Does the program support finishing					
	Are backfat measurements maintained					
	Is feed consumption recorded					
Health records	Is a record made of the animals general health					
Reports	Is the average performance of all animals calculated	•	•			
	Can sows be scored by litter performance	•	•			
	Can sows be ranked by productivity	•	•			
	Are time and labor management (action) reports provided	•	•			
	Are costs adequately broken down into categories					

PROGRAM EVALUATIONS

Advanced Ag Software
Swine Breeding Herd Management System

Settler Computer Technologies Inc.
101 C Hodsman Road
Regina, Saskatchewan
S4N 5W5
(306) 949-9393

The Advanced Ag Software swine package was a complete, professional package suitable for any size of swine herd. Its documentation, packaging and organization set a standard which the other programs reviewed here can aim for. When all software is of this calibre, farmers can begin to make full use of their computers.

FRIENDLINESS

Program documentation consisted of over 250 full-sized pages bound in a soft cover, three-ring binder. The manual is separated into 10 different sections, separated by specially printed, labelled, reinforced dividers. The entire text is typeset, using attractive borders, and different typestyles for emphasis and to make it easily readable.

The manual starts with a preface which deals with the specifics of the particular machine, running the program and introduces the main body of the text. The first three sections of the manual: Introduction, Performance-Costs-Profits, and Features and Overview provide background information and an introduction to the program's operation without going into the specifics. An overview of the system's operation is an important part of the documentation that most manufacturers neglect; if users understand the basic principles and operation, they are less likely to make mistakes when trying to to learn the details of the software's operation.

When the program is delivered to the user, the data file contains the records of a fictitious swine herd. The Practice Program section uses these files to run the user through a typical set of entries to introduce the system. The next three sections of the manual describe in detail the operations of the program. The final section gives a sample of each report available with a complete description of each one, including descriptions of the data used, assumptions and calculations used to arrive at each value and what the report is intended to be used for.

The binder is thoroughly indexed: the table of contents itself is nine pages long, each section contains its own table of contents, and the very detailed index has over 500 entries. This should be one manual where finding specific information does not require a lot of searching.

Error correction with the program is easy; the input has been arranged so as to minimize keystrokes and the possibility of mistakes. Disk records may be changed at any time.

One problem with the program is that messages indicating errors are poor. If the input is incorrect or wrongly formatted, the program simply beeps and clears the input field with no indication of what the problem is. This situation arises often, and makes you unnecessarily frustrated. If the value entered is suspect or incorrect, the program should indicate what the problem is, so that it may be easily corrected.

No on-line documentation is provided with the program. A series of small, well-organized menus is used to control the system. An interesting feature is a section at the top of the screen which always indicates what menu selections have been used to get to the current screen. The menu commands used are non-mnemonic.

SECURITY

The program was very tolerant of operator errors, with the exception of problems with the printer. If the printer was off-line or not turned on, the computer locked up completely; the only way to get started again was to re-boot the machine. As the program locked up, it would tell the operator to check "error 72" in the manual, which indicated "Bad Disk or Disk is Not Formatted" This suggested some minor problem in the error handling system, since there was nothing wrong with either of the disks in use. However, error handling is an area of a program's operation where you cannot afford many mistakes.

Inputs were checked for reasonableness where possible. The program contains a built-in backup facility which will copy the disk in drive B onto a disk in drive A, but only after checking that the A drive does not contain a program disk. The demo version of the program tested was copy protected, but purchased versions of the program are not. The system does not have any access protection mechanisms (e.g. passwords).

INPUT OF DATA

The program has been carefully designed to keep the number of keystrokes required for its operation to a minimum. It is rare that more than one or two characters is required for any input, and default values are provided where possible. After the initial entry of data into a screen, the user can re-enter any of the fields without having to retype any others. The program supports use of upper and lower case characters. The input forms are simple and not particularly sophisticated, but easy to use.

OUTPUT OF DATA

All of the reports generated by the program are intended for 80 column output and are available on either the screen or printer, or are developed on the screen with the option of printing them. When printing reports the program will produce as many copies as the operator specifies. No provision is made to route output to a disk file.

The reports produced by the program are well laid out and easy to use. Each is headed by the name of the report, the date printed and a page number (where appropriate). Descriptive column headings and text, the use of borders, careful spacing and different character styles are used to enhance their readability.

EFFICIENCY

The sample supplied with the program contained records for over a hundred animals, but the program operated without any significant delays. The system has been designed so that it can be used with a hard disk if additional speed or capacity is necessary

INTEGRATION

The program has not been designed to work in conjunction with any other software to date. However, Advanced Ag Software has announced a finishing herd package for the first quarter of 1985. This package should be able to utilize data from the swine breeding herd management system. Since the format of the disk files has not been provided, it would be very difficult to write an application which utilized the files directly.

HARDWARE REQUIREMENTS

This program is available for both APPLEDOS and MS-DOS computers. The program is guaranteed to work with the IBM PC, Texas Instruments Professional Computer, and the Tandy 2000. Whether it is usable with other MS-DOS machines will have to determined by the user. The MS-DOS version requires 128k memory, two double-sided drives and a printer. The Apple version requires an 80 column card, 64k memory, two disk drives, a printer and APPLEDOS 3.3. A comprehensive printer configuration program is provided so that almost any printer should be usable. The program was evaluated using an IBM PC.

MAINTENANCE

The only thing lacking in this program manual is a technical reference section. The software is being distributed by Settler Computer Technology in Regina. The head of the company was always easy to reach by telephone and was cooperative and helpful. Program updates, which are not necessarily required, are produced every couple of years and cost $50. The system has been compiled using BASIC, so it cannot be modified by the end user.

LICENCE REQUIREMENTS

The end user is licenced to use the program on one machine to record one operation only. The manufacturer's liability is limited to replacement of any diskettes which fail to operate within 30 days of purchase. The licence cannot be transferred to any other party, it may only be terminated; this means that the program cannot be sold privately. The licence agreement as provided prohibits the operator from making any copies of the program, including backups. But since the operator's manual recommends that you do make backup copies, it must be assumed that particular portion of the agreement would not be enforced.

CAPACITY

The Breeding Herd Management System can handle the records for individual herds of up to 660 sows, based on a two to seven week weaning period and a maximum of 72 sows bred per group per week. This would include the records of up to 250 boars, with at most 60 boars active in any particular month. If more capacity is necessary, the herd may be broken down into sub-herds, each of which would use a separate disk. The capacity of the program is probably reduced in the Apple version, owing to the lower disk storage capability.

COST

The program as tested cost $795

SYSTEM ORGANIZATION

Beside its record-keeping function, this program also tries to improve management practices. The manual contains a section which deals solely with improving herd management, the program itself is not mentioned once. A system is provided which allows for the editing and printing of a set of management guidelines, which consists of three pages of general information on herd management. The program will maintain a management schedule, which is a set of one or two line reminders in the areas of health, general management and feeding which are printed for each group of sows which are at a particular point in their breeding cycle. The management guidelines and schedule are already filled out when the purchaser receives the package, although the source of the information is not given. Some operators may resent this intrusion of the computer into what they feel is their area of expertise in running the herd, particularly when the source of the information on which the advice is based is not provided. However, since use of these features is optional, the manager can edit the guidelines and schedules to his liking. Including management information along with the reports of the current status of the herd can be very useful, particularly in large herds where additional employees who may not be very experienced can use all the help they can get.

Each female in the herd is identified by a six character number, consisting of two letters or numbers followed by a four digit number. The date of entry into the herd, whether as a sow or gilt, and pen location are recorded. Some important characteristics of the animal are ignored. The birth date, breed composition and sire and dam of the animal are not recorded.

Females in the herd are organized into groups, each group being made up of those sows and gilts which are at approximately the same point in their reproduction cycle. Since there is a maximum of 24 active groups at any one time, in a continuous farrowing operation each group would consist of all animals which had been bred within roughly a two week period.

As each breeding is completed the female is entered into a group. The date most recently bred and the identity of the two most recent boars used are recorded, as well as the animal's location. Pregnancy check results are entered for all animals in a group at once. The results can be recorded individually for each animal as either bred, suspect, aborted, open or pregnant.

As each group passes through farrowing and weaning the litter number for the sow, date farrowed, number born alive, number raised (after deaths or adoptions), weaning date, number weaned, litter weaning weight, sow location and two user-defined traits are recorded.

Some useful features are left out of the BHMS system. The program does not maintain a detailed record of the birth condition of the litter, i.e., number born dead, mummies, deformed piglets, etc. Nor are birth weights recorded. There is no provision to record health problems encountered by either the sow or the litter.

Ten different reports are provided by the program. The Breeding Records Report is available for either a specific group or for all groups in the herd. For each group it lists the group number and the average number of days since the group was bred. For each female in the group it lists the ID number, location, whether a sow or gilt, the date and boar used in the most recent service, the boar used in the previous service (if required) and the animal's current status (pregnant, bred, aborted, etc.).

The Record Summary Report provides a quick listing of all the information stored on a particular animal. This report gives the animal's current group number, location, projected farrowing date, sire and dam, breed composition, birth date, herd entry date, date of last farrowing and breeding and current status (pregnant, bred, etc). Eight measures of the animal's production are included in the report. These include a most probable sow productivity index, breeding value sow productivity index, average days open, average pigs per litter, average number of pigs weaned, average weaning weight and average 21 day weight, as well as the average value of two user-defined measures. This information is followed by a summary of all litters produced by the sow. Each litter produced by the sow has the farrowing date, number born, number in the litter after any transfers were completed, weaning date, number weaned, actual and adjusted weaning weights, sow productivity index and two user-defined traits listed.

The Breeding Management Report is concerned with ensuring sows become pregnant again as soon as possible after farrowing. The report is produced in six parts, each one of which lists all females in the herd which are at a particular point in the breeding process. The six categories used are females not serviced, females serviced and currently open, females serviced and currently suspect, females serviced once and not pregnancy tested, and females serviced twice and not pregnancy tested. For each animal listed (regardless of category) the animal's group number, ID number, location code, number of days open and serviced and the date of the last service are listed. This information is followed by blank spaces in a "Breeding Worksheet" which are used to record information on any breeding activity or pregnancy checks performed on the animal in question. A Sow Group Status report provides a quick summary of the current condition of the herd, broken down by group numbers. After giving the average weaning age you intend to use and the week for which you want the report, the program will give the average number of days into the breeding cycle for each group, estimated farrowing date and whether the group will need attention in the coming week.

The Group Management Worksheet is a very detailed report which is used in scheduling and performing herd management chores. These reports are printed once weekly, and a separate one is produced for each group. Each worksheet contains a list of all the pigs in the group, followed by user-defined management reminders. The reminders are broken down into health, management and feeding categories, and are labelled as to which day of the week the operation is to be performed.

The Breeding Analysis is used to help the operator schedule breedings in order to ensure maximum utilization of the facilities. The operator enters the number of farrowing crates available, the days required for crate cleaning, how many days the sow will be in the crate before farrowing, length of a normal group farrowing period, average age of pigs at weaning, and the number of females which must be maintained as gilts for each gilt required per day. Using these values and the most recently available conception rates, the program recommends the number of farrowings required for each group farrowing period, number of females needed per farrowing crate, number of sows and gilts to attempt to breed per average group farrowing period, number of gilts that will be required in each new group and the size of gilt pool required.

A Projected Farrowings Report lists the number of sows and gilts scheduled to farrow in the coming months, as well as the probable number of pigs per litter and total number of pigs born and weaned. The Boar Productivity Analysis provides a summary of the breeding performance of the boars in the herd. It includes one, three, six and twelve month rolling average production, as measured by a weighted conception rate.

The Sow Productivity Ranking by Sow Production Index lists all of the sows in the herd which have farrowed within a user-specified number of days, sorted by descending "sow productivity index", which is a measure of a sow's productivity in comparison with other sows in the herd which have farrowed at about the same time. For each sow, its ID number, location, most probable sow productivity score (provides an estimate of the sow's future production potential), sow productivity index, number of litters recorded, most recent day weaned, average litter size, average weaning weights and current status are listed.

The Herd Production Efficiency Summary summarizes the current performance of the females in the herd. The statistics are broken down for sows, gilts and the overall herd, and include current and one, three, six and twelve month rolling average values for the total number of litters, live pigs per litter, pigs weaned per litter, pounds weaned per litter, pig death loss and average weaning age.

AGPRO Dairy Herd Management System

AGPRO Software Inc.
R.R. #1
Phelpston, Ontario
L0L 2K0
(705) 322-1592

The AGPRO Dairy Management Program is a complete, full featured record-keeping system for the dairy operator. It acts as a sophisticated herd calendar as well as a production and genealogical record-keeping system. It does not record daily milk production, and cannot deal with any of the financial (i.e. accounting) aspects of the operation. Otherwise it is hard to imagine even the most sophisticated dairy operator requiring a function that the AGPRO program did not support.

The AGPRO program could be better organized. More than 150 programs are distributed over 16 disks, and finding which of the disks is needed requires many referrals to the manual. The program also appears to be unreasonably slow.

FRIENDLINESS

The manual for the AGPRO program consists of 241 pages mounted in a standard 11 inch by 12 inch binder. The documentation falls into four broad categories: general information, descriptions of the data input operations, descriptions of report generation and supplementary help. It was in the area of general information/introduction that the manual was weakest. The AGPRO system is sophisticated and keeps track of numerous dates, values and relationships. How the many inputs, reports and programs in the system were related to one another was not well explained, causing one to be uncertain as to what one was doing or what the result would be. This is a dangerous situation to be in with any program as complex as the AGPRO. I would not feel secure using this program only aided by the information available from the manual and feel that I would need additional help from the developers or dealer.

The manual contained three separate tables of contents; one for the entire manual and then two large ones for the transaction and report generation sections. The latter two tables are used extensively, but are buried inconveniently inside the manual with no index tabs; a few color-coded dividers would help greatly. No quick reference section or tutorial was provided, but the manual did include a glossary of terms, a description of all possible error messages and a troubleshooting section. The manual is generally well-written and easy to understand, but could be improved with a little more elaboration on some of the more complicated operations. The version reviewed had been printed onto continuous feed paper with a good quality dot matrix printer, and was well formatted and easy to read.

There are three types of error correction with the program - immediate correction and correction before permanent updates, as well as corrections in the permanent file. This process was adequate, but often slow. Input errors could usually not be corrected immediately; you had to finish all of the input screen in question and then return to edit it later. Mistakes in the permanent files were all adjusted directly.

The program was entirely menu driven, however the menus were not well implemented. All of the programs required for the AGPRO system could not possibly fit on a single disk. As such this is not a problem; changing program disks once in a while is not that much of a hardship. The problem is that the AGPRO program does not provide the operator with any help in determining which of the 16 possible disks is needed. After users decide which operations they want to perform, they must root through the manual to find one of the two tables of contents. They then look through the table for the operation wanted in order to get the page number which describes the program function. Only after turning to that page will they find the number of the disk that is required. It would be worth while for any buyers of this program to put together their own list of the disk numbers for the most commonly used programs in the system. Even better, the menu system of the program should be designed so that it gives some semblance of order and simply prompts the user to insert the appropriate disk when a change is required.

There is no method to by-pass menu levels; one would be helpful. In several places you find yourself faced with a menu with only one selection, an arrangement which seems to result from a concern for consistency over efficiency. No on-line help is provided. Menu commands are numeric only, but most of the other commands required semi-mnemonic, one character responses.

SECURITY

The program handled input errors well; pressing the break key by accident would not halt the program. The program detected an off-line printer, incorrect disks, disks not ready and handled all problems well. Input checking was excellent. Dates were verified reasonable; where possible input was checked against other data available to ensure that it made sense. For example, it was impossible to enter a purchase date which occurred before the birth date of an animal, and NIP and brucellosis test numbers had to be of the correct format before they would be accepted. Confusion of numeric and character input was handled well. The program also contained a provision to detect possible file corruption owing to an accidental reset or power loss.

The program did not have any built-in provisions for data backup. All of the program disks were copy protected, and each program was access protected as well. A duplicate set of program and data disks is supplied with the initial purchase. The AGPRO program did not have a password system.

INPUT OF DATA

The AGPRO's data editing facilities were limited. Several input screens did not request verification before they were accepted; it was only after all of the input had been finished that the user was offered the option of reviewing the data for correction. When reviewing the input screens, most of the data fields could be left "as is" by pressing the enter key without typing any other characters, however, some of the one-key input fields would not retain their original values, and had to be re-entered. The difficulty with editing combined with its slow operation made trying to get correct data into the AGPRO program difficult. The program supported the limited use of upper and lower case, and the input forms were, in general, very consistent in layout.

OUTPUT OF DATA

The reports generated by the AGPRO program were consistent, well laid out, and easy to interpret. Each report was headed by the name, address, and telephone number of the operator's dairy, the title "AGPRO SOFTWARE INC.", an identifying title, the page number and the date. Each column of data in the report was headed by a descriptive two or three line title. Some of the reports contained room for operators to write in their own comments where appropriate.

Most of the reports were available on the printer only. All of the programs were consistent in performing a form feed after the report was finished so that no blank sheets were wasted, however, it would often consume an entire page and print the report header even though there were no items to be printed on that particular report. Some reports were available on the display, with the option of printing them if so desired. None of the output could be routed to a disk file.

EFFICIENCY

The AGPRO program is slow in operation. Creating records for a single cow in the herd took anywhere from 10 to 15 minutes. This would mean that setting up the basic records for a 100 cow herd would require over 16 hours of typing alone, assuming the program did not slow down as the number of animals increased. Since the other parts of the program performed in a similar manner, setting up a simple herd with this program would require a considerable amount of time, most of it spent sitting around waiting for the program to do its work.

AGPRO programs are written using the BASIC interpreter supplied with the TRSDOS operating system, however, I feel this is not the reason it is slow. Rather, I think inefficient use is made of the disk drives, since while you are waiting the computer is busy accessing the disks, mainly checking for the presence and absence of certain files. The performance of this program would improve dramatically with the use of a hard disk drive; I wouldn't want to use this system without one.

INTEGRATION

The AGPRO program cannot share its data with any other program. Since all of the programs are access protected and the format of the disk files is not provided, it probably would not be possible to create a user-written program to access the system's records.

HARDWARE REQUIREMENTS

The AGPRO system is currently implemented for the TRS-80 model III family (i.e. TRS-80 III, IV, 4P) of computers. The standard hardware configuration consists of a three drive computer with a LPVI, DMP400 or DMP420 14 inch wide printer. The system can work with from two to four drives, with a corresponding change in the number of animals which may be handled.

MAINTENANCE

No technical documentation is supplied with the AGPRO program.

The AGPRO organization is small and new, but if the quality of their product is any indication, they should be a reliable company. The company is currently in the process of establishing a dealer base, but as of writing the program is still only available from the manufacturer. During the review process, the program's authors were occasionally hard to get hold of, but AGPRO has recently acquired an on-site programmer, and has installed an answering service. When contacted, the developer was able to offer quick and helpful advice.

The AGPRO program was written using the BASIC interpreter supplied with the TRS-80 computer. All of the programs have been protected with a password so that the end user of the program does not have access to them, and therefore the user would not be able to modify or inspect the source code if necessary.

LICENCE REQUIREMENTS

The AGPRO program is warranted to perform in accordance with the program's documentation. All diskettes are guaranteed for 30 days from purchase, after which a replacement cost of $35 per diskette is charged. The manufacturer disclaims all other liabilities.

CAPACITY

	Two Drive System (as tested)	Three Drive System (standard)
Cows/Heifers	100	200
Pedigrees	300	600
Bulls (AI and other)	30	50
Steers	30	50
Embryo groups	30	50

Additional capacity is available with the use of a fourth disk drive.

COST

The AGPRO Dairy Herd Management System costs $1200 for all versions regardless of the size of the herd the program is for.

SYSTEM ORGANIZATION

It would be impossible to describe in detail all the functions of the AGPRO system in the space available. While this program may lack somewhat in documentation and friendliness, it cannot be faulted in its ability to monitor and assist in managing a dairy herd. The program has been developed in consultation with dairymen in Ontario, and in this case it is apparent that the consultation has paid off.

Each animal within the herd is identified by a three character eartag number. For cows and heifers all three characters are user defined, but for bulls and steers only the last two characters may be used. The program also records a NIP or pedigree number for each animal, which can be used to identify the animal in some cases. Each animal's birth date, purchase date (if bought), disposal date and reason, and sire and dam identification are maintained.

The program maintains a very extensive breeding calendar and record. Given the previous heat date, it will predict the next heat date and will warn you three days before you need to begin checking for heat. The dates of the next to last and most recent breeding are recorded, and a date for the next possible breeding is predicted. The number of breeding attempts and bulls used is recorded, and a rating of ease of breeding is maintained. The program automatically calculates the date for a pregnancy check from the last known breeding date, and records the result of the test and a date for a re-check if necessary.

From the successful breeding date, the program can predict the recommended drying off date and the possible calving date. When each calving occurs a new calf record is created, the type depending on the sex of the calf born.

The system will record milk production in either pounds or kilograms. Daily production is not recorded, instead summary data is entered whenever a test is performed. For each animal the number of days milked, weight of milk and fat produced, percentage protein and fat, BCA percentages and deviation from herd averages are recorded. Each animal can be rated as to milking speed and production. Feed consumption is not recorded.

The program maintains complete health records and a health procedures calendar. Whether the animal has received a rumen magnet, deworming treatments, vitamin shots or has cleaned after calving is recorded. The date and treatment of the two most recent occurrences of mastitis are recorded, as well as the total number in the animal's life. Animals with outstanding infections or other health problems are flagged for attention.

The program also maintains records and a calendar for embryo transfer operations. The latest superovulation, heat inducement and flush dates are maintained, as well as the number of times flushed, embryo group and cow type.

Finally the program can store information for bulls and cows not owned by the farm, but which are used in the production of pedigrees.

The reports produced by the AGPRO system are too numerous to mention individually. The main one used is the critical maintenance report, which comes in two forms; a simple one which is run daily and a more detailed one which is done weekly. This report gives all of the dates requiring the operator's action in forthcoming days, with respect to any aspect of the herd's operation.

The program is capable of producing extended and summary pedigrees for any animal in the herd. The summary pedigree is a three generation family tree which is displayed on the screen, the detailed pedigree is a three page report which gives the performance of the animal in question as well as a summary of the performance of the two preceding generations.

The other reports available collate and summarize the various performance measures and important dates maintained by the program. They include animals due for embryo operations, bull use histories, herd lists, animals due to dry off, brucellosis test day due, current lactation production, cow/bull comparison for breeding, heifers over age or not bred, herd semen inventory, etc.

The only aspect of performance which the AGPRO program does not measure and which is particularly missed, is the area of feed consumption and expenses. This program provides an excellent method for tracking the herd history and day-to-day operations required, but will not offer much assistance in the determination and control of costs.

Agri-Management Services, Inc. Poultry Package
Version E

Allwest Computer Systems
116 - 16 Avenue N.W.
Calgary, Alberta
(403) 230-4272

Since this is the only poultry program which has been reviewed here, a formal set of evaluation criteria has not been laid out. Instead a quick summary of the program's features and capabilities will be presented.

The Agri-Management Services (abbreviated AMS) poultry program is an extremely simple record-keeping system intended for both the broiler and layer poultry producer. It claims to be a "combination management record-keeping and accounting system", but the simple expense and income records which it will maintain are not an accounting system in even the crudest sense. It would be better classified a physical record-keeping system which is capable of simple income and expense tracking.

The example software tested was slow, awkward, unreliable and full of bugs. The manual was incomplete and what it described often was not what the program did. The people selling (and supposedly servicing) the product were completely ignorant of its use and function, and required 15 minutes to even figure out how to start the demo. In short, as presented this package is completely useless, and should not be considered under any terms except as an example of how not to make and sell agricultural software.

Besides the poultry package, AMS also makes beef cattle, swine, and accounting programs. Since the dealer had only very limited demonstration packages for these programs, they have not been reviewed.

FRIENDLINESS

The same documentation was presented in two forms; as a pile of tractor feed sheets which had not been separated yet and as a pile of tractor feed sheets which had been separated and mounted in a three ring binder. No tutorial or quick reference sections were included; in fact it would have been nice if the manual had at least covered all of the features of the program. The main body of the manual consisted of one-by-one descriptions of each of the commands available from the main menu. However, the manual supplied was probably not for the version of the program evaluated, as the program contained an additional selection on the main menu that was not even mentioned in the documentation, and the program often required inputs or performed operations which the manual did not describe.

Error correction was simply non-existent. Once an operation had been selected there was no turning back, an incorrect entry could neither be corrected before it was stored on disk or after. The program used several very short, simple menus for its control. The menus used single digit numbers for their control.

SECURITY

The program was sensitive to operator errors. Entering data out of order, using bad data, etc. all caused the program to crash and return to the operating system. Worse yet the program was unreliable even if mistakes were not made. During evaluation, a flock entered into the system disappeared suddenly without a trace. Whenever a flock number was required, the program would prompt "Enter flock number, or -1 for a list of flocks". Entering -1 would cause the screen to be cleared and a header to be printed, but the promised list of flocks never did materialize, only a re-issuing of the flock number prompt. The program was constantly printing "PAUSE" and waiting for the enter key to be struck before proceeding when it didn't make sense to do so. Whenever you tried to print a report, the program returned to the operating system after printing "*EF*" (supposedly meaning "end of file") before even a single line of the report had been printed. It was as if someone had written the program without actually getting around to trying to run it.

INPUT OF DATA

The program had no editing facilities. Once a field had been entered there was no way to return to the previous one. Neither were any of the input screens verified before they were stored. The program did not really use input screens as such, it just streamed questions past the user teletype style. The program did however seem to work quite happily with upper and lower case.

OUTPUT OF DATA

The program can supposedly generate its reports on either the printer or the screen, but since neither would actually work, there is no way to verify if it were true or not.

EFFICIENCY

Despite its simplicity, the program was very slow. A lot of time was spent waiting while new programs were loaded when moving from one menu selection to another.

INTEGRATION

The program had difficulty dealing with its own data files; it would be unthinkable to expect it to handle any others.

HARDWARE REQUIREMENTS

The program was evaluated on a Televideo TPC-1 portable computer. This is a fairly straightforward CP/M machine, so I assume the program should also be available in other CP/M formats. An MS-DOS version of the program is also available.

MAINTENANCE

No technical documentation was supplied with the program. The dealer appeared to know almost nothing about the program. Some assistance might be available from the manufacturer of the program, but its United States location and lack of a toll-free number make it an expensive proposition.

The program has been written using a compiled language of some sort (probably BASIC) so it could not be modified by the end user.

LICENCE REQUIREMENTS

The program is sold to the user without warranty, "soley (sic) on an "as is' basis". In case of a breach of the licence agreement, the developer claims the right to seize all copies of the program without compensation.

CAPACITY

Since as in any poultry package, individual animals are not tracked, the capacity of the program will be limited by how many entries are made and how many different flocks you want to maintain. The program is limited to a maximum of 200 flock records at any one time.

COST

The Agri-Management Systems Poultry Package sells for $1,700.

SYSTEM ORGANIZATION

The AMS poultry program tracks the birds in terms of flocks through their production cycle from the time they enter the operation until sale. As each flock is initially set up, a flock number consisting of a single letter followed by a number is assigned to it. Flocks are recorded as to type, (layers, meat production (broilers), or layer replacement) hatching date, date birds moved in, number of birds moved in, source of the birds, breed codes, producer's name and address, (which has to be re-entered for each flock even though it is the same) where housed and a description of the feeders and waterers used.

Daily entries for each flock are made to record health, production, expense and other information. The first thing entered is a medication code and the cost of any medication administered. Evidently, flocks looked after by the AMS program must be fairly healthy, as there is only provision to record one type of medication in any one day. Another code is used to record any health problems observed.

The total amount of feed, cost per unit and a ration code make up the daily feed record. A ration code identifies the different feed mixes used; each ration is described as to energy content, percentage protein, calcium, phosphorus, lysine, methionine, trytophane and sulfur.

Final entries recorded daily are the number of birds which have died, dozens of eggs layed, low and high temperature achieved, gallons of water consumed and two comments; a general one and one specifically for environmental observations.

Most of the expense information for each flock is entered once as a lump total; individual expense entries are only available for medication and feed costs. A total of all expenses for the flock can be entered under the classifications of initial purchase, fuel, labor, equipment, building, transportation, utility, contract and service costs.

Income is entered on a weekly basis. Once a week for each flock, the average price per dozen and net case weight, the gross receipts, and the percentage or number of extra large, large, medium, small, cracked, lost, dirty and grade B eggs are recorded.

Two reports are available from the system. The "summarize information" program would normally be performed as each flock is sold. It calculates the total cost and amount of feed consumed, the cost and amount of feed for each dozen eggs produced, total number of birds dead, highest and lowest temperature observed, average daily water consumption, total number of eggs produced, average daily percentage of hens laying, percentage of eggs cracked, average net case weight and prints them out in a brief report. The main menu included a "reports" option, but selecting it always crashed the program, and since it was not mentioned in the manual, it is impossible to comment on what reports if any were available.

Basic Business Systems Farm Management System
Crop Projection, Land Management, Commodity Inventory Programs

Basic Business Systems
226 - 1055 Park Street
Regina, Saskatchewan
S4N 5H4
(306) 359-1021

This system is actually three semi-independent programs: a Crop Projection program to assist in planning, a Land Management program to record the results of the current crop and a Commodity Inventory to record the stock on hand. The only data shared among the three programs are the definitions of the fields, crop types and bin numbers used. The programs are well written, easy to use and understand, and have excellent error correction and editing facilities. But while the program does perform all of the basic functions needed to track production, inventory, costs and profitability for the grain producer, it does not provide for the recording of some of the more detailed information such as weather conditions which greatly affect crop performance. More seriously, the program does not provide for a method of summarizing data over a number of years.

FRIENDLINESS

Basic Business System's program manuals are an excellent example of how software documentation should be written. The only complaint which can be levelled at it is that it has been produced by photocopying the output from a poor-quality printer which, while legible, is not very professional looking. The manual is well written, uses many illustrations, and fully and clearly explains the operation of the program without being excessively wordy.

The manual contains an introduction and general information about the system, a recommended set-up and operation procedure, individual descriptions of the commands available in the separate programs and samples of typical reports. The 61 pages of documentation (not including the sample reports) are mounted in a standard size (10 inch by 11 inch) three ring binder. The manual is organized into sub-sections, which are divided by grey cardboard dividers that lack labelled tabs, the inclusion of which would make finding things much easier. The manual does not contain a tutorial section, quick reference or index. A very detailed table of contents is included, however the page numbers it provided were often one or two pages out of sync with the text.

Error correction with the program was very simple. Mistakes in the permanent files were adjusted directly. The program was menu driven; several menus were used but all were small, well organized and easy to use. There was no facility to bypass menus but it was not missed. There was no on-line help system. The menu commands used letters of the alphabet, but were not mnemonic.

SECURITY

The program was very tolerant of operator errors. It would halt if the Ctrl-break key combination was pressed, but could be restarted without loss of data by entering "cont". Insertion of an incorrect disk was always detected, and the user was given an opportunity to correct the problem without stopping the program. An off-line printer caused the system to lock up without a warning message. Input was extensively checked for reasonableness and dates were verified as correctly formatted.

The program relied on the use of operating system facilities for data backup. The programs as supplied were neither copy nor access protected. No passwords were required for access to the system.

INPUT OF DATA

The program had very simple but effective on-screen editing. When inputting data, the enter key was used to move from field to field on the screen. Pressing enter after typing the last item on the screen would cause the cursor to move back to the first field on that screen; in this way errors could be corrected as pressing enter alone would cause a field to be accepted unchanged, allowing you to move quickly to the item which needed correction. After you had made as many passes as necessary to fill all the necessary data fields and make any corrections, pressing the Fl key caused the program to verify the input reasonable, after which if no problems arose, the input was stored. Some of the data entry operations required the use of two screens; in these cases the F2 key was used to move between the two displays. This method of input is very simple to learn and use, the only limitation being that on a couple of the larger input screens it was tiresome to have to pass through up to 15 fields in order to correct a mistake. The program supported use of upper and lower case characters, automatically converting them when necessary. The input forms were consistent in layout and operation.

OUTPUT OF DATA

The reports produced by the program were well laid out and easy to use. Each one was headed by the name of the report and the program that produced it, the farm name, the date and a page number. Non-abbreviated column headings and descriptions were used. All reports were available on either the screen or printer, but could not be sent to a disk file.

EFFICIENCY

The program was very quick in operation. No annoying delays were encountered.

INTEGRATION

The three programs of the Basic Business Systems product use the same field, crop and bin descriptions. Otherwise they do not cooperate in any way. This is unfortunate; it will be necessary when harvesting to enter much of the same information twice; once into the land management system and again into the inventory program. None of the crop programs can be integrated with the accounting system from the same manufacturer. The data files are standard BASIC random-access files; since the source code can be examined by the purchaser, it should be a fairly straightforward operation to create software to access them if necessary.

HARDWARE REQUIREMENTS

The Crop Management, Land Management and Commodity Inventory programs of the Basic Business System's Farm Management System are available for Commodore 8000 series and MS-DOS computers. For the Commodore, the minimum requirements are an 8050 dual disk drive and the standard Commodore printer. With MS-DOS, 64k memory is necessary for the IBM-PC, 128K on other systems; dual 320K disk drives and an Epson printer are recommended. (Since none of the reports use any special characters or effects, any common printer should be suitable). The program could probably be used with a hard disk drive without too much difficulty. The system was evaluated using an IBM-PC.

MAINTENANCE

The program is distributed by its developer, located in Regina. They were easily reached by telephone, and knowledgeable and helpful. Updates are not provided to purchasers of early versions of the program.

The system was implemented using the BASIC interpreter supplied with the IBM PC on which the program was evaluated. The code was not copy or access protected, and on examination was well laid out and contained some comments. Since the software is easily examined and modified, the purchaser of this series of programs could expand or correct the program if necessary.

LICENCE REQUIREMENTS

Each copy of the program and manual is licenced for use by a single user. All warranties and liabilities are denied by the manufacturer; no provision is made for the replacement of faulty media. Improvements or corrections to the program may be completed by BBS without having to inform purchasers of early versions of the program.

CAPACITY

A separate data disk is used for each of the three systems. For the Land Management and Crop Planning programs, the system can store 100 fields and 99 operations per operation category (693 operations in total) on each diskette. The Commodity Inventory program can maintain 100 bins on each diskette. A maximum of 50 commodities (types of crops) is available for the entire system.

COST

The price of the system depends on how many of the three programs are purchased.

Number of programs purchased	Cost
one	$ 500
two	$ 900
three	$1200

SYSTEM ORGANIZATION

The capacities listed above are for the entire system, not for each year. As the program is organized it will only maintain records for a single year, a nearly useless situation for crop records which only become valuable after many years' worth of records become available. By retaining the backups each season, it would be possible to get around this situation somewhat, however some system to allow for the maintenance and summation of previous years' records would improve this program greatly.

The Land Management and the Crop Planning programs are exactly the same in operation, the only difference being that the titles on the reports are different and that they use different disks to store their records. The idea is that when planning for the next year, the Crop Planning program is used to fill out estimated costs and returns, while the Land Management program records the actual costs and returns which occur during the season. Since it is a much better record-keeping than planning program (it cannot compare the projected figures to the actual ones, and is more awkward to use for this purpose than a spreadsheet template would be) only the operation of the Land Management program will be described here.

Each field is identified with a 10 character alpha-numeric code. A twenty-five character description and location entries are recorded for each field, the area seeded, summerfallowed, uncultivated and the estimated value of the land. All of the values in the program may be entered in either imperial or metric units, and output from the program is always given in both systems. For rented fields, the landlord's name and address and either the cash rent or crop share which the landlord gets is recorded.

The record of jobs performed on each field is broken down into pre-seeding, fertilizing, seeding, chemical, summerfallow, harvesting and other operations. For each operation completed the field code, size of area worked, name of operation and date completed are maintained. Other information is recorded depending on the nature of the job performed. For pre-seeding and summerfallow procedures, only the cost per unit area is recorded, from which the total cost for the field is calculated. Each fertilizer or chemical application is recorded as to application method, type of product, whether liquid or granular, the amount and cost per unit area and the total cost for the field. At seeding the seeding method, crop seeded, amount and cost per unit area, and total cost for the field are set. Information recorded for harvesting operations include the cost per unit area, crop harvested, grain reaped in total and per unit area and price per unit received for the grain. From this the income per unit area and total income for the field are calculated. Operations which do not fall into any of these categories are classified as "Other Operations", and a name and the cost per unit area are recorded.

Three different types of reports are available from the land management program. All of the reports may be produced for either all or a specific field, and will include only those operations which take place between two user-defined dates.

The All Operations Detail report lists all of the information stored by the program for the field or fields selected, grouped by operation type. For each operation type the total cost for the year per unit area and for the field is determined. At the end of the report the income and expenses for the year are summarized for each field.

The All Operations Summary provides much of the same information as is provided in the All Operations Detail, except that the details of each individual operation are not included, only the total of each operation type.

The other report provided is a detailed printout of all operations of a particular type. For each job completed, the date, description, area, cost per unit area and total cost are printed. The total cost per unit area and for the entire field for all operations of that type are calculated.

The Commodity Inventory program is used to keep track of the storage and value of the crops produced. Each bin is identified by a 10 character alpha-numeric code. A description, location and capacity for each bin is recorded. Each time grain is added to a bin the date, type of crop, field which it came from, quantity stored and the landlord's share (if applicable) are entered. If the bin has grain in it when more product is added, that crop type is automatically defined for the additional grain. The landlord's share is also calculated automatically.

When selling, the product, date, crop name, bin taken from and buyer are recorded. Much of the input is produced automatically; the bin code is the first item entered, from this the crop code is set and a list of the source fields is printed. From this list the operator selects one field to credit with the sale. The quantity sold is broken down into dockage, shrinkage and landlord's share.

Ten different reports are available from the inventory program. Six of the reports list the amounts in storage or delivered by commodity, field, or bin (i.e. all grain stored listed by the type of commodity, all grain delivered by commodity, stored by field, delivered by field, etc.). The storage reports list all of the additions to inventory which have occurred involving the selected crop, bin or field. Each entry includes the date, bin identity, field from which the grain came, the gross quantity and the landlord's share. The total stored and the total landlord's share in storage is calculated. The delivery reports give the date, the bin it was taken from, field in which the crop was grown, amount attributed to dockage, shrinkage, and landlord's share and the price sold at. Totals for all of the deliveries completed are printed at the end of the report. For both the storage and delivery report only those transactions which fall within a user-defined range of dates are listed.

Reports on the Commodity Totals, Field Totals and Bin Totals list the amount of grain on hand sorted by either the type of grain, the field which the crop was grown or which bin it is stored in.

The Landlord Statement is intended as a summarizing report to be submitted to the owner of the rented land. It includes basically the same information as is in the delivery report by fields, except that the landlord's name and address is included in its heading.

Countryside Data Beef/Cow/Calf Herd Manager

Countryside Data
4013 Nipigon Road
Lethbridge, Alberta
TIK 4P8
(403) 320-0782

The Countryside Data Beef/Cow/Calf Herd Manager is an easy to use program for the recording and utilization of beef herd performance information. Unfortunately, it places too much emphasis on the performance evaluation aspect of herd management, as a result it lacks such simple, basic facilities as a physical description for each animal or a herd list which gives the current calves for each cow. As a result, the program would be very useful as an analytical tool, but a manual herd book of some type will still be necessary for most users. Repeated program failures took place during testing, but none resulted in a loss of data.

FRIENDLINESS

Seventy pages of blue colored looseleaf documentation was supplied with the program. The manual included an extensive and very useful introduction to the program's operation, a tutorial run through the input of a typical set of data, descriptions of the reports available, a section on program setup and initialization and a sample set of reports. The manual was well written, complete and easy to understand. It included a table of contents, but no quick reference or index. Most of the screens and menus used by the program are illustrated. A standard (8 ½ inch by 11 inch) three ring binder was used for the manual.

Error correction with the program was easy and quick. Any field of an input screen could be edited without having to re-type the other fields. Incorrect entries in the disk files were adjusted directly.

The program was operated from two large menus, one for data input operations, the other for report generation and system maintenance. Each menu was located on a separate disk, as a result you had to alternate between two program disks while running the system. A command on each disk was supposed to transfer you to the other disk without having to exit to the operating system, but in the system evaluated this feature did not work reliably. It was safer to exit the program completely, change disks, perform a cold boot and then start the program again.

An extensive help system was included with the program. Whenever input was required from the operator, typing Ctrl-Q would cause a several-line help message to be printed at the bottom of the screen. The messages supplied were different for each input field in the program, so that the assistance provided was always applicable to the problem at hand. The help system was useful and helped make up for the lack of an index or quick reference in the manual. Unfortunately it did contain one bug: requesting help on one of the inputs when requesting a herd summary resulted in the wrong message being printed.

The menu commands used consisted of non-mnemonic single characters, but many of the other inputs required were mnemonic, and as a result easy to use and remember.

SECURITY

The program was generally tolerant of operator errors. Using the Ctrl-break key combination would cause the program to halt, but it could be restarted without affecting the program's operation. Inserting an incorrect disk was detected by the program, while a disk not ready was detected by the operating system, which allowed you to correct the problem without crashing the program. A switched off or off-line printer would cause the program to lock up without any sort of message being printed.

Unfortunately the program would fail often as a result of problems not caused by the operator. The system crashed several times after printing a line of gibberish followed by the message "error in helps (sic) file". When using the escape feature to edit items on the screen, fields would occasionally be filled with meaningless characters. While these problems were minor, and all disappeared on re-running the program, they tend to reduce the user's confidence in the program.

Input verification was poor. Dates were checked to be the correct format and reasonable, but were not checked against other values in the program for credibility, e.g., it was possible to enter a purchase date for an animal which occurred before its birth date. Substitution of character and numeric data was handled well.

The system has no built in provisions for data backup; it is left up to the operator to master the CP/M utilities required. The program disks on the system tested were not copy or access protected. No password system was used.

INPUT OF DATA

Editing with the Countryside program was good. While entering items into the program, pressing the escape key would give you the option of either having the screen entered as it was, moving to the first or last item on the screen, or leaving that section of the program altogether. Pressing enter before any of the other keys would cause the value in a field to be accepted unchanged, unless doing so resulted in an error. Altogether this made for easy, quick data entry, though it was less effective on the larger data screens than other systems might have been. The program supported full use of both upper and lower case characters, and the input forms were well laid out and consistent with one another.

OUTPUT OF DATA

The reports generated by the system were easy to obtain and understand. Each report was headed by the date and page number, the name of the farm and the type of report. Good use was made of column headings and descriptions. All of the reports were available on either the screen or the printer, except for one which required condensed print because of its width. There was no provision to send the reports to a disk file.

EFFICIENCY

The program was very fast in operation. The only delay occurred just prior to the printing of the herd summary when records had been changed since the last printing of the report while the program re-calculated the index of each animal.

INTEGRATION

The Countryside program is not designed to work with any other programs. The format of the records on the disk is not supplied, but they appear to be simple random access files and might be accessible to the advanced programmer, given sufficient time and effort.

HARDWARE REQUIREMENTS

The Countryside series of programs is designed to run on all computers which support the CP/M or CP/M-86 operating systems which have at least 64k memory, two disk drives and a printer. The demo system supplied did not have a printer or computer configuration program, so it is assumed that it must be set up by the dealer prior to each installation.

MAINTENANCE

No technical documentation is supplied with the Countryside system. The dealer has been long established in Alberta, and was very helpful and knowledgeable about the program when contacted, though he could be hard to get hold of at times.

The program has been written using a compiled language of some sort, so that the source code is not available to the purchaser.

LICENCE REQUIREMENTS

No formal licence agreement was supplied with the programs evaluated.

CAPACITY

The number of animals handled by the program is limited only by the disk storage capacity available. As an estimate approximately 1 K of storage should be provided for each cow in the herd, however this figure will vary depending upon how many calving records are stored for each animal. It is possible to increase the size of the herd maintained at any time by adding extra disk capacity or reducing the information stored for each animal.

COST

The Countryside Data Beef/Cow/Calf Herd Manager is sold for $550.

SYSTEM ORGANIZATION

This program has two modes of operation: a "Two-Calf Plan" and a "Total Herd Plan". The difference is that with the two calf organization, records are only maintained for the first two calvings in a cow's lifetime; with the total herd option, records are maintained for all calvings in the animal's lifetime. The intention is that the first plan is used for larger herds or for operators who do not want to maintain detailed records, while the other option is for those managers who want to maintain a more complete set of information for each cow. The program was evaluated using the full herd mode of operation.

Each animal in the herd is identified with a six character alpha-numeric ID number. Recorded for each animal is its weight, birth date, origin, dam identity, type (cow, heifer, etc.) and breed composition. Provision for a physical description of the animal, a necessity for most herd operators, is missing.

Neither the sire, dam of the cow or any of its calves is recorded. For each calving the date, sex, calving status (full term, premature or aborted), original and weaned calf history (normal, died, orphaned, adopted or unaccounted for) and calf ID number are maintained. The system has been organized to allow it to handle and record abnormal situations such as adoptions or calf losses, but it cannot handle twins.

Cow and heifer performance are measured with the use of an index score calculated for each animal. Each animal is scored on 11 characteristics: pregnancy status, calving date, calving status, calf birth size, calf weaning weight, calf weaning frame, cow milking ability, cow health, mothering instincts and two optional user defined categories. The scores range from A (excellent) to E (inadequate), and all of them are assigned manually by the operator except for the pregnancy status, calving status and calving date scores which are assigned automatically by the program. The calving date score is determined by the period the calving fell in. For example, you could set up your system so that all the animals that calved between March 12 and March 19, 1984 received an A score, those that calved between March 20 and April 10 received a B score, and so on for C, D and E scores. This system is almost unworkable. For those operators who calve all of their animals during the same period every 12 months, the system would work adequately, except that every year the dates would have to be re-set to the current year. But for herds where calvings occur at different times of the year or who try to obtain a calving period other than 12 months, this system would be a problem, since in many cases, the predefined dates would not be accurate for the particular animal, and the score would have to be manually set. A better system would record the breeding date or when the bull entered the herd, and would determine the calving date score from the number of days lapsed until calving, rather than whether the birth fell within a particular range of calendar dates.

The index for each animal is calculated from its scores in each category using a set of user defined weightings. Each scoring category is weighted in importance from 0 (no importance) to 10 (very important). The final score reflects the percentage of the total possible points that the animal has achieved. This system of measuring animal performance is useful and flexible but must be used with caution. A lot of care and consideration will be necessary in setting the importance of weightings and in assigning scores to ensure that the final index obtained for each animal reflects its true worth.

The program will allow you to record the purchases and sales of animals throughout the year. However since the program does not track expenses or incomes for the herd, the information stored here will be essentially the same as should be recorded in your accounting system and not of much use. For each purchase or sale the buyer/seller, type of animals, date, number and price per head are recorded.

The program will record a set of herd production goals for each year. Three separate sets of annual production goals are set up, one each for older cows, two year olds and heifers. The user can set goals for the desired percentage of animals which were open, aborted, late or went full term during the year. Acceptable levels of calves lost before or after branding, unaccounted for or weaned can be set. Finally the desired average weaning weights for steers and heifers, the average bred female weight goal, and the planned total weight of steers and heifers weaned are recorded. After setting the production goals for the year, you can then enter an 80 character comment as to why each goal was or was not achieved, followed by a three line general comment.

Ten different reports are produced by the Countryside program. The Individual Cow Summary prints all the information stored by the program for a particular cow. Besides the general information and the details of each calving, a weaning ratio (weight of weaned calf divided by the weight of the cow) is calculated for each year as well as an overall score and index rating for the animal.

The Herd Summary Report lists the performance scores for each of the eleven categories for all calvings recorded for the animal as well as the cow's index score, birth date, and ID number. All of the animals in the herd may be listed, or only those whose birth dates fall within a specified range. The report has two other options, whether the report will be sorted by ascending ID number or by descending index number, and whether all qualifying animals are to be printed or only those at the beginning or end of the list.

The Open Cow Report gives the ID number, calf year and index number for each open cow currently in the herd. The total number of cows open and the percent of all cows open is calculated.

The Annual Production Report summarizes the performance of the entire herd for the year. The total number and percent of total is given for animals open, aborted, late and full term, and for calves dead before and after branding, weaned and unaccounted for. The average weaning weight and weaning ratio is listed for steers and heifers, and the total weight of steers and heifers weaned is printed. For some reason the weaning weights and average weight per bred female must be estimated by the user in order to calculate the weaning ratios, even though there is provision to record both values for each individual animal when using the full herd plan. The program should be able to use the weights already recorded to calculate the exact average weights, rather than relying on an estimate.

The Annual Production Goals Report summarizes the production goals entered as part of the herd history. Separate goals are set for cows, first year heifers, and second year heifers.

The Breeding Cattle Inventory lists the original and final inventory of animals for the year, as well as the source of changes. The herd is broken down into cows, first and second year heifers and unbred cows. The number of animals which have entered the herd through being raised, purchased and transferred from other classifications in the herd is given, and the numbers left as a result of corrections, sales, changes in classification, deaths or unaccounted for is listed. An estimate of herd value is prepared, given average prices for each class of animal.

The Purchases Summary and Sales Summary simply list back the same entries which were entered by the operator. The Systems Values Report prints all of the user set parameters required to configure the program for different operations. Finally, the Annual History Comments provide a listing of the comments entered as part of the herd history function.

Countryside Data Hog Management

Countryside Data
4013 Nipigon Road
Lethbridge, Alberta
TIK 4P8
(403) 320-0782

The Countryside Data Hog Management program is a simple, easy to use system for tracking herd activity and performance information for the hog farrower/weaner, combining the functions of a breeding wheel or calendar and a herd record keeping book. It does not keep track of feed use or other expenses, therefore it will not help with cost control. A companion feedlot module for the program will be available shortly. One program failure occurred during testing, but did not result in a loss of data.

FRIENDLINESS

The program manual consisted of forty-six 8½ inch by 11 inch pages mounted in a three ring binder, with an additional 11 pages of sample reports. Included were an introduction to the system, a familiarizing tutorial using the sample data provided, and a suggested set-up procedure containing descriptions of the operations available. The manual is generally well written, helpful and easy to use despite being awkwardly organized in a few places. The manual illustrates all of the various prompts and inputs which are used by the program. No index or table of contents is provided, which makes finding information on a specific topic a chore, but a three page "terms and assumptions" section acts as a glossary, including definitions of the performance measures used. Samples of all the various reports available from the program are also included.

Error correction with the program was very easy. The cursor control keys were used to allow you to move to any part of the screen to make corrections. The file records could be adjusted directly in all cases.

The program was entirely menu driven. Only five menus are required for the entire program, and they were all short and easy to use. No on-line help was provided, in fact error messages were poor or non-existent in some places. When inputting ranges of dates for the action reports, if the dates given were outside the allowable range, the program simply beeped and made you re-type them without any indication of which date was wrong, or why. All of the menu commands used were numeric.

SECURITY

The program was adequately protected from operator errors, but could be made to fail quite easily. If the shift-break key combination was pressed the program would halt, and the operating system would present the user with the option of either continuing the program or returning to the operating system. If a disk drive was not ready, the operating system would stop the program and provide you with three options, one of which would allow you to correct the problem and continue. Insertion of an incorrect disk was detected by the program. If the printer was off-line, the program would lock up waiting for it to be started without informing the operator of the problem.

Verification of input was good. Dates were checked to be correctly formatted and reasonable, and dates which did not make sense with respect to the other data recorded for an animal were flagged. Substitution of numeric and character input is handled well.

The system does not include built-in provisions for data backup, relying on the user to use operating system utilities. The programs and disks tested were not copy protected. No password system was provided.

INPUT OF DATA

Entries to the program were organized as screens of data containing fields which the user had the option of filling. The cursor control keys could be used to move to and edit any field on the screen. Once the data were entered, pressing Ctrl-E would cause the program to check the screen for errors. If a problem was found, the cursor would be placed at the incorrect entry and an error message was printed, otherwise the disk files were updated. The escape key would always return you to the previous menu at any point in the program. Altogether, this system provided an easy and accurate method for getting data into the program.

The system supported use of upper case characters only. The main input form was large (44 entries) but was well organized and easy to use. The other input forms were similar in layout and use but much smaller.

OUTPUT OF DATA

All of the reports from the program except one were headed with the name of the report, the farm, and the date. All information in the reports was well labelled with column headings and/or described. The reports were generally well formatted and easy to use. A form-feed was performed after each report was finished except for the action reports, which required that you perform a manual form-feed if so desired. I assume this was so that you could print all of the action reports for the day on a single sheet for convenience in carrying with you, a useful feature but one which could be handled a little better.

Most of the reports used 80 column output, but some required extra width. The system includes a very extensive set-up program which allows you to configure it to any printer, so that the extra width reports did not require a wide carriage printer, but could be produced on one which supported condensed print. All of the reports were available on either the screen or printer, except those that were restricted to the printer by their width or size. There was no provision to send output to a disk file.

EFFICIENCY

The program was very fast in operation. The only noticeable delays occurred when printing reports, and even they were not long enough to be irritating.

INTEGRATION

The records of the Hog Management program were not intended to be used with any other software. No information is supplied as to how the records are organized on the disk, but they appear to be simple, standard BASIC style random access files which could probably be used by the experienced programmer should the need arise.

HARDWARE REQUIREMENTS

The Countryside series of programs is compatible with most any computer which can use the CP/M 80 or CP/M 86 operating system. The program was evaluated using an IBM PC with dual 320K disk drives and an Epson MX 100 printer, which proved more than adequate. The computer and printer setup program contains pre-set parameters for most popular ones, and in addition the parameters may be set individually by the user in order to accommodate non-standard devices.

MAINTENANCE

No technical documentation is supplied with the Hog Management program. The dealer used (located in Lethbridge, Alberta) has been in the farm microcomputer software business for many years, and should be highly reliable. Helpful assistance by telephone was usually quickly available.

The program has been written using a compiler of some sort, probably the BASIC language. As such, the source code is not available to the end user, so that the program cannot be modified.

LICENCE REQUIREMENTS

No formal licence agreement was supplied with the program.

CAPACITY

No limit is given to the number of sows the program will support, instead the capacity of the program is determined by the disk storage available. As a guideline the program suggests a figure of 1K disk capacity for each active and inactive sow record that you wish to maintain. Additional storage will be required for the boar records. When setting up the system the program will ask for the number of sows, boars and average number of litters per sow's lifetime that you will want to store: from this it will make an estimate of the disk capacity required, so that if additional capacity will be necessary you will know before the herd's records have all been entered.

COST

The Countryside Data Swine Management program as tested sells for $550.

SYSTEM ORGANIZATION

Each animal in the herd is identified with an eight character ID which can consist of any combination of letters and numbers. Recorded for each sow is a tattoo number, the identity of its sire and dam, a family line indicator, the birth and entry into herd dates, breed, three vaccination dates and a user defined score. Only a breed and a comment field is maintained for each boar. No record is maintained of the source or disposal of the animal.

Up to nine litter records may be maintained for each sow. The title litter record is misleading, the breeding, weaning and sow performance records are also maintained here. Three different breedings are recorded for each litter, with a date and up to three boar identities stored for each. The program allows you to establish three separate pregnancy checks which are used for all sows in the herd. For example, you can set up the program so that each sow will be flagged for a pregnancy check at 25, 35 and 55 days. The results of all three checks are maintained for each sow.

Given the successful breeding date, the program will predict the farrow and weaning dates. The program also allows three vaccinations and two special reports to be defined, for each of which a number of days after breeding may be set so that all animals that far into their cycle on a particular day will be flagged.

When each litter is produced, the date, number born alive and dead, number alive after three days, and total weight of the litter is recorded. The number of piglets transferred and adopted by the sow is maintained and piglet loss can be broken down into seven different categories. Each litter record allows you to determine a subjective evaluation for each sow based on 10 measures of performance, for each of which you assign a mark between one and five.

At weaning, the piglets, total weight weaned and pen number are recorded. Finally each litter record allows you to set up three user defined conditions to record, and provides for a 23 character comment.

Fourteen different action reports are available from the program. Given a range of days bred (e.g. from 15 to 21 days after breeding) the program will list all animals within that range that require attention for the condition specified. Action reports are available for sows open, heat and pregnancy checks, farrowings and weanings due, vaccination or other procedures required, or farrowing past due. These reports are intended for time and labor management and to draw attention to sows who require timely attention. Also available is a sow worksheet, which provides a single-page form which the herd manager can take out to the barn to collect the data which will be later entered into the program. While a good idea, the spaces left for the users' input on the work sheet will be too small for all but the neatest handwriters.

Four reports are available which describe herd performance. The weekly report summarizes the herd activity for the week ending on the specified date. It lists the sow ID, litter number, date and boars used for all breedings completed, totals of each category of animal, numbers of first, second, and third breedings completed with sows and gilts, total number of animals farrowed and weaned, and boar usage.

The monthly report (which for some reason is called a production analysis in the report heading) gives the monthly and year-to-date totals for most of the information stored by the program. The total number of litters, and total and average number of piglets born alive and dead are given for both sow and gilt litters. A percentage litter scatter (defined as the percentage of litters born with less than seven piglets alive) is calculated for each month. Similar figures are also produced for the piglets weaned. The second page of the report contains a breakdown of the causes of recorded deaths for each month, the number of first, second and third breedings performed, total number of breedings, percentage of successful first breedings and the total number of matings per recorded breedings.

The sow history produces a record of all the information for a specific sow, including the complete breeding, farrowing and weaning history, a breakdown of recorded piglet deaths by cause, and average performance over all weanings recorded.

The final report available from the system is the index listings. These reports allow you to list the identity of a specified number of sows whose performance is either at the upper or lower end of the scale. The criteria by which the lists may be generated are piglets alive per year, piglets weaned per year, production index or mothering index. These last two indexes are calculated for each sow in the herd. The production index is defined as "designed to measure a sow's production using the farrow to farrow interval and the piglets alive after three days", while the mothering index is defined as "based upon Ohio States production and selection criteria". These are hardly precise definitions of how these indexes are calculated, and while they may be familiar to most hog producers and perfectly reliable and usable, it is bad practice to rely on a unit of performance measure without fully understanding what it measures or how it is determined.

Cutlass Herd Management System
Version 2.00

Mayjo Software Incorporated
Box 5, Site 3, R.R.#1
Okotoks, Alberta
T0L 1T0
(403) 933-7628

The Cutlass program is primarily a genetic stock improvement tool for the commercial and purebred cattle breeder. It is patterned after the federal-provincial Record of Performance program, and is intended to give its user much of the same information and benefits as the former does, while avoiding the delay which results from having to use a mail-in service. For this purpose the program works well, and provides for flexibility, promptness, and reliability that ROP could never equal. However there is some trade-off in that the records maintained by an independent program like this one will lack some of the "authority" of ROP outputs. The program does not deal in any way with the financial aspects of the herd's operation. Another version of the same program, called Sabre, is available for sheep flock management.

FRIENDLINESS

The manual for the Cutlass program consisted of seventy-six pages printed with a dot matrix printer which had been mounted in a plastic report cover. The manual was easy to read and understand, and covered the program's content well. It included an introduction, a brief program overview and description of the program's operation, as well as a detailed run through of each of the commands used. The manual as reviewed did not contain a tutorial or quick reference section, but a table of contents has been provided.

Error correction with the program was generally adequate, but was sometimes awkward. Most input screens required verification before they were accepted, but in some cases if there was a problem all of the entries on the screen had to be re-done, even if there was only a problem with one. In some places the escape key was used to accept the default or previous entry to a field (which in itself is non-standard), while in other places this feature did not function. Any of the records in the data files could be changed or deleted at any time.

The program had a unique method of control. It was mainly organized in terms of menus, but the menus did not all function in the same way. When moving from program to program a one-digit number was used to choose from among the selections offered, and it was not necessary to use the enter key to invoke the chosen program. However, once in the sub-program single character, mnemonic menu selections were used, and the enter key became necessary to activate the chosen function. Menus of this second type were often difficult to use. For example, after having the records of a certain cow displayed on the screen, it was possible to get a quick listing of the cows whose tattoo numbers were just above or just below that of the cow selected. However, once this listing was on the screen there was no way to return directly to the main record that you had just been looking at without re-entering either the cow's tattoo or the internal program record number. Granted, this situation is a bit unusual, and except for occasional problems such as this one the approach taken by the program does allow for quick and easy access to the herd records with a minimum of keystrokes. More consistency and a little better organization would make this program easier to use.

SECURITY

The program was sensitive to operator error. In the Index Calves section of the program, it was very easy to completely crash the machine by performing operations out of order. When printing was attempted with an unready printer one of two things would happen. Either the program would go dead without warning or it would print "Need segment PRNTERR: Put volume PROGRAM in unit 4 then type <space>" and then lock up. While this error message may be meaningful to a UCSD operating system hacker, it will be meaningless to 99.9% of the people who buy the program. The system was very good at detecting either a wrong disk inserted or a disk drive not ready.

Input error checking was very good, with the user's data being both verified as being formatted correctly as well as being checked against other values available for reasonableness. Substitution of numeric and character data was handled well.

The program contained built-in data backup facilities. The program disk is copy protected, but an additional copy of the system is provided with the initial purchase and additional copies, if necessary, are available for $5 per disk. No password system was provided with the version tested.

INPUT OF DATA

Editing the input data with the Cutlass program was possible, but awkward. As explained earlier, the escape key was used to accept the default data in an entry field. In other programs, pressing the enter key alone performs this function. Once you become familiar with the program, this peculiarity should not be a problem. Another peculiarity is the date format used by the program. In keeping with the reproduction of the functioning of the ROP program, the Cutlass program formats its dates as three two digit numbers, ordered year, month, day. This arrangement is confusing to someone who is not familiar with ROP, as almost every other program uses the month, day, year ordering for dates. The program supports complete use of upper and lower case characters, converting them from one to the other when necessary. The input forms are generally well laid out and easy to use, but lack somewhat in consistency.

OUTPUT OF DATA

The reports produced by the Cutlass program are well laid out and easy to interpret. Column headings and titles explain the report, but are often too abbreviated. Each report is headed by the name of the program and the title of the report, with the date printed but page numbers are not included.

The output of the program is fixed, reports either go to the screen or the printer. A 15 inch carriage printer is recommended for the program, but any printer that will support 132 characters in a condensed print mode will suffice. There is no provision to send output to a disk file.

EFFICIENCY

The program tested came with data files already entered for 176 cows. The system was quick, no noteworthy delays occurred when accessing data or loading programs. The program may be used with a hard disk if more storage capacity or speed is required.

INTEGRATION

The program does not contain provisions to work with any other software packages. The company is currently planning to develop an accounting program which may integrate to some degree with the Cutlass and Sabre systems. The organization of the disk files was not included in the documentation as reviewed.

HARDWARE REQUIREMENTS

The program is available on a wide range of machines. A promotional pamphlet claims that the program "can operate on 8, 16 and 32 bit machines containing any of the following processors: Z80, 8080, 8085, 8086/8087/8088, 6502, 6809, 68000, 9900, PDP-11, LSI-11 and VAX". That impressive claim is made possible because the program has been developed using the UCSD-p operating system, which allows software to be transported readily. There are Apple II, IBM PC, TRS-80 model III/IV, and Sage versions of the program available. While conversions to most other machines should be possible, it may be difficult depending on the availability of a version of the UCSD system for the computer in question and hardware limitations such as disk capacity and memory size. The minimum configuration required to run the program involves two disk drives and 64k or 128k memory, depending on make of machine, an 80 column by 24 line display and 132 column printer.

MAINTENANCE

No technical documentation was supplied with the program. The Cutlass program has been developed and is being sold by John and Ken Lockhart in Okotoks. It is derived from a version originally developed for their own use on a TRS-80 model III. The Lockharts were easily reached by telephone, were knowledgeable about the program and should be an excellent source of help to their customers. Four or five hours of initial instruction and set-up assistance are provided with the initial licencing of the program.

The first update is free after the purchaser buys the program, thereafter a $50 annual "Service and Licence Fee" is required for you to continue receiving updated versions of the software.

The program was developed using the UCSD-p operating system, with the original source code written in Pascal. The system is supplied with an abbreviated version of the UCSD program, so a purchaser of the Cutlass program does not have to make any additional software purchases. The choice of the UCSD operating system is a good one, since it will protect the buyer's software from obsolescence as it can be easily transferred to other hardware. Some difficulty may arise with the hard disk version of the program, if you want to store both Cutlass files and files from other applications on the same disk, since very few other programs use the UCSD-p system. Since the source code is not provided, the program cannot be modified by the end user.

LICENCE REQUIREMENTS

The program is licensed on an annual basis without warranty and with the usual complete disclaimer of liability. The disclaimer also states that the manual and software are "subject to change without notice".

CAPACITY

Storage capacity of the program is limited by the capacity of the disk drives available to it. The manufacturer supplies these figures as a guideline:

Computer	**Drive Capacity**	**Record Capacity**
Apple IIe	140k	800
Radio Shack I, III, IV	178k	1050
IBM PC & compatibles	320k	1600 to 1900
Sage II	640k (800k)	3750 (4700)
Hard disk version (10m)	10000k	59000

COST

The initial licence for the Cutlass and the Sabre programs cost $1,495 each.

SYSTEM ORGANIZATION

Animals in the herd are identified by "standard" herd identity tattoos consisting of three parts: a one to four letter prefix (which may be assigned by a breed association or national livestock registry office) and a one to four digit individual animal number followed by a year letter. The program will accept the tattoos entered in either upper or lower case and in almost any format, and automatically converts them to the correct form.

The main record for each animal may contain as much of the following information as is available: the breed registration number, Health of Animal tag number (used to record brucellosis vaccinations), birth date, sire and dam identities, host cow identity (for embryo transfers or adoptions) and a breed code. At birth the sex, birth weight and condition, calving difficulty, color and horn condition of the animal are recorded. The options available for recording color are red, black, white face, brockle, yellow and white. A record of growth and development statistics is maintained for all animals, including mature cows and bulls. This record contains the actual and adjusted birth weights, actual and adjusted weaning and yearling weights, indexes and rankings, a hip height measurement, frame score, and for bulls, a scrotal circumference.

The other information stored for each animal in the herd is kept in "subsidiary records" files. Subsidiary records are available for breeding, medical, embryo, weighing, showing, and disposal information. When the main data screen is displayed for an animal, it includes an indicator as to which, if any, of these subsidiary files contain entries for the animal in question.

The breeding subsidiary record contains an entry for each time a female in the herd is bred. At each breeding the tattoo of the cow, the bull, and the result of any pregnancy test performed are recorded. If the cow was AI'd or the breeding observed, the actual date is recorded, otherwise the dates that the bull entered and left the pasture are entered.

The medical record contains an entry for each problem encountered with the cow during her lifetime. The tattoo of the cow, date, problem encountered and the treatment performed are entered. An entry to the embryo subsidiary record is made for each superovulation and flushing completed. It includes the date of the original flushing, the bull used, the number of embryos successfully flushed, transferred, frozen, the number of animals impregnated and the number of calves finally born.

At each weighing a record is made of the animal's tattoo, date weighed, weight observed and health condition. Subsidiary records of show animals contain the tattoo of the animal shown, the date shown, name of the show participated in and the animal's placing.

Subsidiary records may be accessed in two ways. The contents of the files may be observed and modified through the subsidiary records program, which deals with each type of record (breeding, weights, etc.) separately and is not organized to give information on individual animals. Subsidiary records may also be viewed through the main record file access program, in which the files of individual animals are made available.

The Cutlass program contains two report printing programs, however one of these is part of a sophisticated animal selection mechanism which is capable of producing almost any breakdown of the herd data of interest to the herd manager.

The simpler of the two report programs is the Pedigree Certificate. It is produced for a single animal or for a group of animals, and summarizes performance potential and ancestry. The certificate lists the animal's identity, sex, breed composition, birth date, whether a single, twin or transplant, and the birth, weaning and yearling weights, gains, indexes and rankings. This information is followed by a simple family tree which gives the lineage of the animal for the preceding three generations. The breed registration, breed make-up code, and adjusted weaning and yearling weights and indices for all 14 animals in the family tree are printed.

The Cutlass system contains a select records program, the output of which is used in several ways. The program allows you to select animals from the herd on the basis of information contained in any of the data records which are maintained, either in the main or the subsidiary files. Animals are selected which meet a set of criteria set up by the operator of the program, the criteria being of the form:

<data field>   <relationship>   <value>

For example, you could have the program select all bulls born between January 1 and Dec. 31, 1983 whose weaning index was greater than 110 in order to determine which would make good potential breeding stock. The selection criteria which would be required would look something like this:

Sex = Bull
Birth Date >= 83-01-01
Birth Date < 84-01-01
Year Index > 110

Once cattle have been selected by this program, two things can be done with them.

a) The records can be printed, which is where the report generation aspect of the system comes in. For each animal selected the main records are printed (identity, sire, dam, breed code, sex, weaning and yearling gains, average daily gain and current status) followed by the records from any or all of the subsidiary files (at the user's option). This system provides for a powerful reporting mechanism, which will allow herd managers to see information summarized which is of particular interest.

b) The other option is to index the cattle selected by their weaning or yearling adjusted weights. This is only available for animals which have not been indexed before, are of the same sex and are born within a 90 day period. Usually this process would be done after weaning, while on feed test, or after yearling weights are obtained. As the animals selected are entered into the indexing system the user is prompted for the weaning or yearling weights. The average daily gain for each is then calculated, and the selected animals sorted in descending order by adjusted weight.

The Cutlass program's strong point is in performance measurement and evaluation. It will be a very useful tool for the selection of superior animals with which to improve the breeding herd. However, it ignores the other aspects of herd management such as time and resource management and recording and analysis of herd costs and income. It will be up to potential purchasers of the program to decide whether the benefits offered by the Cutlass program are worth its cost.

Dawson, Dau and Associates Ltd.
Feedlot Management Program
Version 1.0

Dawson, Dau and Associates
402 - Mayfair Place
6707 Elbow Drive S.W.
Calgary, Alberta
T2V 0E4
(403) 284-6538

The Dawson and Dau feedlot management program is a simple, easy to use program which would be suitable for basic record-keeping in the smaller commercial feedlot. It will track the inventory of both cattle and feed in the system, and can produce reports to provide for the billing of customers and a profitability analysis. Its usefulness for the larger operator will be limited by the lack of an integrated accounting system.

FRIENDLINESS

Documentation for the program is a 40 page, coil bound, typed manual. It contains a short tutorial on initiating and setting up the system, followed by individual descriptions of the commands available. The manual contains no illustrations or index, but the table of contents is sufficient considering the amount of documentation present.

The manual is generally complete and accurate but tends to be overly brief. While the reviewer had no difficulty in operating the program, an individual with little or no experience with computers would require much more assistance than that supplied by the manual. Otherwise the manual is well written and easy to understand. The reader is referred to sections of the Apple Pascal manual for assistance in performing some of the basic machine operations such as copying disks, so it will be necessary to obtain and use them to run the program.

Errors are generally easy to correct. All of the input fields can be edited before being submitted to the program. Incorrect entries in the system are corrected either by changing the values stored in the data file or by making an offsetting entry.

The program is entirely menu driven. All menus are placed at the top line of the display and are the same format. The menus are easy to read and use and require only a single key, mnemonic command to activate the function selected. There is no facility to by-pass menu levels, and no on-line documentation is supplied.

SECURITY

The system is generally tolerant of operating errors. It is impossible to cause program failure by making keyboard errors, with the exception of hitting the reset key when it has not been disabled. An off-line printer is not detected resulting in the program becoming locked up. If a wrong disk is inserted in place of the data disk, the program assumes that a new system is being set up and begins the process of reformatting the disk. While it is possible to stop the reformatting process before the original contents of the disk have been destroyed, a warning message of some sort should be included.

All inputs are verified for correctness where appropriate. The program can handle the substitution of character for numeric data. A built-in data backup program is not provided, so the operator has to exercise caution not to overwrite valuable data when performing backups. The program disk as tested is not copy protected. The program has no access protection (e.g. password) system.

INPUT OF DATA

The program provides effective editing facilities within each entry field, but cannot move back to previous fields to make corrections. As well, many of the input screens do not double check questions to ensure that the entries are correct before they are accepted as done. The program supports the limited use of upper and lower case on the reports which are sent to the printer, but only upper case is used in most cases because that is all the computer can display. The input forms are generally well laid out and easy to use.

OUTPUT OF DATA

The reports generated by the system are easy to read and understand, though perhaps a little overcrowded in some cases. Each report is headed by a descriptive title and the items in the report are clearly labelled. All reports are available for 80 column output only and can be sent to the screen, printer or communications port, but cannot be placed in a disk file.

EFFICIENCY

The system generally has a very fast response time; it is never necessary to wait unreasonably for the program to complete an operation. The generation of reports is limited only by the time required by the printing.

INTEGRATION

The program is not designed to work with any other programs and cannot save its output to disk. It is impossible for the owner of the program to access the records on the disk file without a UCSD Pascal system and a description of the format of the records on the disk.

HARDWARE REQUIREMENTS

The system requires an Apple II series computer with 48k memory and UCSD-p Pascal language option, two disk drives and an 80 column display and printer. The program can be operated with the standard 40 column Apple display, but it is not recommended. Since versions of the UCSD-p system are available for most computers, conversions to other hardware should be fairly easy if necessary.

MAINTENANCE

No technical documentation is supplied with the program. The system is sold directly by the developer in Calgary, who was readily available for assistance. A $250 "1 Year Automatic Update Service" is available which entitles the purchaser to any program changes or new features which are produced during the year, otherwise service is limited to the correction of program errors. The program cannot be modified by the user, since the source code is not available. The developer does not generally customize the program for individual users. The program was developed in Pascal using the UCSD-p operating system.

LICENCE REQUIREMENTS

Dawson, Dau and Associates disclaim any warranty or liability for the "quality, performance, merchantability or fitness for any particular purpose" of the program at the front of their manual. The program is sold strictly on an "as is" basis. No provision is made for the replacement of faulty diskettes.

CAPACITY

The program currently has the following operating limitations:

Maximum number of clients:	255
lots:	255
pens:	94
animals per pen:	255
separate rations:	47
ration ingredients:	31
animals in a group:	4095

In practice, these maximum values may not be achieved owing to the restricted disk capacity. The manual includes a section to help users estimate what storage their records will require, so that they can determine whether or not the program will be useful in their particular situation.

COST

Complete package as tested: $500

Two options are available for the evaluation of the program before purchasing it. A copy of the manual may be purchased for $20, or a demo package consisting of the manual and a restricted operation program may be purchased for $30.

SYSTEM ORGANIZATION

Setting up a feedlot with the Dawson and Dau program begins with the definition of a client list. The name, address and phone number of each client of the feedlot is recorded. A list of all the clients on record can be printed.

The program separates the cattle being fed into lots, which are further subdivided into groups identified by a range of eartag numbers. Records of individual cattle in the feedlot are not maintained, therefore the system cannot be used to determine the production of individual animals. Associated with each lot are an owner's name and address, a yardage charge per head per day, an opening account balance, and an amount paid on the account to date.

The sex and pen number, date into and out of the feedlot, last date fed, weight and value on entering and leaving the feedlot, weight and value of feed fed, yardage and non-feed costs are recorded for each group. A daily record is made of the amount and value of each ration fed to each lot, and a summary of the total amount and value of each ration fed to the lot over the month is calculated.

Once placed in a lot, the cattle are then allocated to pens. Each pen is described as to maximum capacity, current population and a status (in use, empty, under repair or hospital use). A listing of the current contents and status of all the pens is available. Feeding is usually done on a pen basis. Animals may be moved from one pen to another in any grouping, even individually.

Invoices are printed individually for each lot. Each invoice lists the name and address of the owner of the lot, the opening and outstanding balance owed the feedlot, amount paid to date, any interest charges (there is a user defined monthly rate applied to overdue accounts), and costs incurred during the current month. Charges incurred during the current month are broken down into feed, yardage and non-feed expenses. The invoices also include a physical description of each lot owned including pen number, sex, dates in and last fed, and total weight and value on entry. The invoices produced are complete and well laid out, however they would be much more useful if they were set up in such a way that they could be printed directly onto a proper invoicing form. As it is now, the information on the invoicing report would have to be transferred by hand to another form before mailing.

The profit and loss analysis is developed individually for each lot, and summarizes the profitability of the feeding program. After a physical description of the lot contents, the opening and closing dates, number of head, and number of pen days and feed days are listed. The expenses, income, and weight gains recorded for the lot are totalled and then given on a per day, per unit weight, per unit gain and per head basis as appropriate. Included are the initial, current and gained weight, total feed fed, cattle purchase cost, feed, yardage, non-feed and interest costs, and current value of the cattle. The report calculates a net return and an annual rate of return, given the current selling price of the animals.

The program also includes facilities for the automatic pricing and inventory of feedstocks. The user can define the value and on-hand amount of up to 31 possible ration ingredients, as well as a percentage markup to be applied when billing customers. Using these ingredients, 47 different rations can be formulated, defined in terms of percentage by weight of each component. The pricing of all rations is done automatically, using the prices recorded with each ingredient. Feedings are recorded by number of pounds of ration per pen or block (which allows feeding a different ration to groups of animals within one pen). The system automatically updates the inventory of feed and bills the appropriate owner with each feeding. A listing of the ingredients or rations currently defined can be printed.

Homestead Farm Management System
Beef Herd Record-Keeping Module
Version 2.5

Homestead Computer Services Ltd.
2979 Pembina Highway
Winnipeg, Manitoba
R3T 2H5
(800) 665-8825
(204) 261-6740

The Homestead Beef Herd program is a powerful, easy to use system which can track a large amount of performance data of interest to the cow/calf operator. It has the ability to calculate many useful measures of performance and to produce very detailed user defined reports. The program does not keep track of production expenses — it will be necessary to use information from your accounting system and some other method to calculate your costs per pound production, etc. No program failures occurred during testing.

FRIENDLINESS

Documentation for the Beef Herd module consisted of thirty pages divided into two sections, one each for the Beef Herd Record-Keeping Module and the Beef Herd Simulation Module. Each section contained an introduction, a start up procedure, and individual descriptions of the commands available. The record-keeping manual also contained a sample set of reports. There was no tutorial or quick reference provided and each section had a short table of contents but no index. All of the documentation for the Homestead system is mounted in a single 9" by 7" three ring binder. Like all sections of the Homestead manual, this portion has been printed in extremely small type.

Error correction facilities with the program are adequate. Entry errors were easy to correct, and mistakes in the disk files could be adjusted directly. The program is entirely menu driven and each menu is short and easy to use. There is no facility to by-pass menu levels, but none was required. The program had no on-line help or documentation facilities. Commands used are all numeric.

SECURITY

The system was generally tolerant of typing errors, but would fail immediately if any other kind of error (such as a disk or printer not ready) occured. The program did detect the insertion of an incorrect disk. Inputs were checked for reasonableness where appropriate, and substitution of numeric and character input was handled well. The program relied on the operating system for data backup; the program disks were not copy protected. The system evaluated did not have a password system, but one is available for those who require it.

INPUT OF DATA

The editing abilities of the Homestead program were limited but adequate. The backspace key was used to eliminate incorrect characters from the current input field and could return you to the previous one. All screens requested verification, but if there was a problem you had to re-type all of the fields after the one in which the mistake had been made. Considering that this could mean having to re-do up to 21 entries, it is not an adequate means of correcting mistakes.

The program supported limited use of upper and lower case characters. In general the input forms were easy to use and consistent, except that the main data input screen was too large and complicated, with user input and computer generated values confusingly mixed.

OUTPUT OF DATA

The reports prepared by the system were well laid out and easy to understand. Because of the large amount of data stored for each animal the user selected reports can only print a portion of the information stored for each animal in any one report, as a result three separate printings are needed to see all the information on any one animal. All reports of the record-keeping system are printed using the compressed print mode of the printer, while those of the simulation module all use 80 column output. Some of the reports are restricted to the printer only because of their size. There is no provision to route output to a disk file.

EFFICIENCY

The program had a very fast response time, and generation of reports was very quick. However the way the system has been programmed it must search through the records of all the cattle in the system each time a report is generated. As a result the generation of reports may slow substantially as more animals are entered.

INTEGRATION

Neither program of the Beef Herd module can cooperate with any program of either Homestead or non-Homestead origin. The data files maintained by the program would not be usable with user written software.

HARDWARE REQUIREMENTS

The Homestead Farm Management System requires an IBM PC, IBM compatible, or Vector Graphics computer with dual double sided disk drives and a printer.

MAINTENANCE

No technical documentation of use to the programmer is supplied with the Homestead manuals. One of the strengths of the Homestead system is the ready access to help which is provided by their being a local company. A one day training session is supplied with each system installed.

The Homestead system has been written using a BASIC compiler, as a result the source code is not available to the purchaser. Custom programming is available on an individual basis.

LICENCE REQUIREMENTS

The Homestead system is licenced to the purchaser for use on a single machine, and may be copied only for the purpose of supplying backups. The licence may be transferred (sold) to another party provided that the original buyer does not retain any copies of the program. The seller's liability is limited to the replacement of defective diskettes only.

CAPACITY

The record-keeping program maintains 23 pieces of information for up to 1000 animals. Note that this is 1000 animals in total, not a 1000 animal herd, i.e. if you want to keep records for animals which are not still in your herd, these must be contained within the thousand. The number of cattle for which records can be maintained may be expanded if disk space allows.

COST

The Beef Herd Module of the Homestead system costs $1000; $250 for the Beef Herd Simulation Program and $750 for the Beef Herd Record-Keeping program.

SYSTEM ORGANIZATION

A complaint with the Beef Record-Keeping system is that it treats the bulls, cows, yearlings, and calves in the herd exactly the same. While you definitely will want to record the birth, weaning, and finished weights of a breeding heifer, once it has entered the herd as a cow you will not need to use this information often, if at all, since the performance of her calves will be what determines the value of the animal. But the Homestead system will continue to give you this information, regardless of the status of the cow. It would help simplify some of the reports and input screens if the program would maintain a record of the status of each animal, so that the input which is requested and the data which is printed in reports is related to the function of the cattle in question.

Each animal within the herd is identified with a ten character eartag or tatoo number. Recorded for each is a second tag number, sire and dam identity, a purebred association registration number, and a name.

The program does not maintain a breeding log (i.e. dates bred, pregnancy checks, etc.). The birth date, birth weight, sex, horn condition and a calving remark are recorded for each animal.

A weaning weight and date are recorded by the system, as well as a yearling weight and date. Finally the program records a five character group description, a fifty character remark field, and an active/inactive marker for each animal.

The system will calculate a number of performance measures for each animal in the group. At weaning, a 205 day adjusted weight, rank, and weaning index may be calculated. For each yearling the daily gain, gain index, 365 day adjusted weight, 365 day index and a rank is determined. The indices and ranks are based upon all animals within a specified group (as defined by the user) for a certain year of either or both sexes. The program cannot calculate any indicators of performance for the cows based on the performance of their calves.

All of the conventional reports produced by the Homestead program are user defined. Rather than presenting the user with a set of pre-programmed reports from which you select the one that you want, the Homestead system allows you to choose up to five criteria, after which the program will print the information stored for each animal which falls within that criteria. For example, you can choose to see all of the animals in your herd which are polled, had a wean index greater than 100, a daily gain better than two pounds per day, and were sired by a specific bull. Since you can tell the program to select on the basis of any five of the pieces of information stored for each animal this provides you with the possibility of producing thousands of different reports. This is the kind of flexibility that most programs lack, and will allow the user of the Homestead program to see the information which is most important to him. There are two things which could be done to make this method of generating reports more useful. It would simplify operation of the program (especially for the new user) if it had several pre-defined reports that could be used immediately. Also, the experienced user of the program could make use of more complicated report generation facilities, for example, the ability to sort the entries in the report based on the values in any specified field.

The program's other report is a five generation family tree. After you specify an eartag number, the system will print a two page geneology chart which gives the four preceding generations of the animal specified.

The Beef Herd Simulation Module is a least cost feed ration program for pregnant or lactating cows. It is essentially the same program as that used in the Feedlot Module with different data. Given the weight of the cow, length of feeding period, whether the cow is pregnant or lactating, and the weather conditions the program will determine a suggested energy, protein, calcium and phosphorous intake. The user can either accept these values as given or adjust them to his own levels.

The program then proceeds to the selection of five feed ingredients from a list 28 pre-defined feeds, whose attributes may be set by the user if he so desires. After setting a cost and a minimum and maximum amount of each feed in the ration, the program will calculate a least cost ration.

The least cost ration program is easy to use and sufficiently flexible so that it should be a useful program for most producers. Any changes that the operator makes to the values used by the program are stored on disk for later use. The program was very fast.

Homestead Farm Management System
Crop Record-Keeping Module
Version 2.5

Homestead Computer Services Ltd.
2979 Pembina Highway
Winnipeg, Manitoba
R3T 2H5
(800) 665-8825
(204) 261-6740

The Homestead Crop Record-Keeping module is a simple, easy to use program. However, it is limited in many ways: it does not interface in any way with the accounting system from the same manufacturer, it cannot keep detailed expense records, and it will retain its very simple crop history for only a five year period. Several program failures occurred during testing, but none resulted in a loss of data.

FRIENDLINESS

The Homestead program manuals came in a 9 inch by 7 inch binder which contained the documentation for all of the other "modules" of the system. The crop system's documentation consisted of 42 pages separated into two sections, one each for the record keeping and simulation programs. Each section contained a suggested set-up procedure, individual descriptions of the commands available, and a set of worksheets which are used to lay out the account names and input required for the programs. The manual contains many illustrations of typical screens, and in general is complete and accurate.

The manual contains no index or quick reference, however, the table of contents for each section is short enough that it is easy to find the page required. It is somewhat difficult to find the section of the manual desired since there is no overall table of contents for the binder.

On screen error correction was adequate. Errors in the records could either be adjusted directly or corrected via an offsetting entry.

The program is completely menu driven. The menus are numerous, but each one is short and well organized. There is no method to by-pass menu levels, which would be convenient in some cases. No on-line documentation is supplied, however, there is a system which allows the operator to see what account names, fields, etc. are available without having to use a separate reference. The menu commands are numeric.

SECURITY

The system was generally immune to keyboard errors. However, if an error of any other type occurred (e.g. disk not ready, division by zero, etc.) the program would fail immediately, returning you to the operating system without giving you a chance to correct the problem. Using an incorrect disk was generally detected.

Inputs were checked for reasonableness where appropriate except that it was possible to input values into the crop simulation program which would cause a division by zero error. Substitution of character and numeric data was handled correctly. The Homestead system relies on the PC-DOS commands format and diskcopy for data backup. The programs were not copy protected. The system tested did not have a password system, but one is available for those users who require it.

INPUT OF DATA

Editing facilities with the Homestead system were limited. Usually the backspace key could be used to erase incorrect characters in the current line and to return to the previous screen or field, however, this was not consistent, on some screens the 'c' key was used to cancel incorrect entries. All screens required verification before they were accepted, and if the verification was rejected all that was required in most cases was the re-typing of the incorrect fields only. The program supports the use of both upper and lower case characters, and the input forms are on average easy to use and understand. In general, the system has been designed to minimize the number of keystrokes required, but the inconsistent use of keys caused some difficulty initially until the operator became familiar with the program.

OUTPUT OF DATA

The reports generated by the system are numerous and complete, but are awkwardly formatted in many cases. Each report produced by the record-keeping system is headed with the name of the report, the date on which it was printed and the page number. The reports are all produced for 80 column output and are available on the printer or the display, but not on disk. The record-keeping program does a form-feed at both the beginning and end of each report, as a result it tends to waste a lot of paper.

EFFICIENCY

The program generally had an adequate response time. There were some noticeable waits while the program changed menus or when the help system was used, but they were not significant. The most annoying delays occurred when trying to create new expense accounts — the program insisted on returning to the main menu after each account had been added, requiring you to re-enter the command when you wanted to add more than one account at a time. Reports were produced very quickly.

INTEGRATION

The Homestead's individual modules operate independently of one another, with the exception that entries to the inventory system may be made from the other modules. The biggest drawback of this approach is that you end up having to duplicate many of the entries and accounts in both the accounting and crop management system. The data files used by the program are too numerous and complicated to be accessed by non-Homestead programs.

HARDWARE REQUIREMENTS

The Homestead system runs on an IBM PC, IBM compatible computer or a Vector 4 computer, which has at least 64k memory, two double-sided disk drives, and a printer capable of 132 column condensed print. The system was evaluated on an IBM PC with a hard disk drive, which proved more than adequate for the program's operation.

MAINTENANCE

The manual contains no technical information of use to the programmer.

One of the strengths of the Homestead system is the amount of user support which the manufacturer supplies. A one-day set up and training session is supplied with the system, and the close proximity of its dealers should ensure that the purchaser of this program can get assistance quickly.

The program has been written using a BASIC compiler, but since the source code is not provided it would not be possible for the user to modify the program. Homestead will customize and modify programs on an individual basis.

LICENCE REQUIREMENTS

The purchaser is licenced to use the program on a single machine, and to make backup copies of the program. The licence may be transferred (sold) to another party as long as the seller destroys all copies of the program. The usual provisions of manufacturer non-liability apply. The media (diskettes) on which the programs are distributed are warranted for 90 days.

CAPACITY

The program can maintain records for 99 fields over a maximum five year crop history. Up to 1,800 expense accounts may be maintained for each crop year.

COST

The crop enterprise module of the Homestead system costs $1,000; $750 for the record-keeping module and $250 for the simulation program.

SYSTEM ORGANIZATION

The Homestead crop module's two sections (Crop Record-Keeping Module and Crop Simulation Module) operate independently of one another; in fact they appear to have been written by different programmers. The crop simulation module is similar to the many "best crop" type of programs and Visicalc templates which are available. Given your planting intentions, expected yields and projected expenses and prices, the program will calculate an estimated cost, income and profit on a per tonne and net basis. The program also includes a "marketing analysis" section which allows you to examine the outcome of various combinations of board, non-board and domestic marketing combinations, provided you have accurate estimates of quotas and prices available. While the crop simulator does its job, it is no better or worse than the many other programs of this type which are available.

Each field within the record system is identified with a two digit number. Recorded for each field is a 20 character description, a size in acres and a crop number. Each crop is identified with a two digit number, associated with each crop type is a 20 character description and a unit of measure.

Expenses incurred in producing the crop are recorded in a set of expense accounts. These accounts are divided into "fixed" and "variable" expenses, however, these terms are misleading and would be better described as overhead and operating costs, the difference being that "variable" costs are entered individually for each field, while the "fixed" costs are spread over all of the fields, based on the acreage. This is not an acceptable way of breaking down costs which cannot be allocated to a specific field. The machinery costs per acre of growing canola are not the same as those for growing hay, but the Homestead program pretends that they are, and as a result if you use the program as directed by the manual you will get inaccurate production cost figures. The accounts in the crop system are similar in organization to those in the accounting system, being separated into major and sub-accounts.

The system allows the user to record a soil analysis and a field history for each year. The soil analysis record stores the field, date, nutrient levels and a 20 character comment while the field history records the date sown, seed rate, yield, fertilizer applied and a comment. The field history should allow the recording of much more information to be useful, i.e. it should be possible to record pesticide applications, weather conditions, tilling operations, etc. As well, it should be possible to maintain a field history for an indefinite period, not just five years. The value of a physical record-keeping package is derived from having a detailed history of production practices and their effects on yield and income so that you can determine the optimum income producing strategy. As it stands, the Homestead does not allow you to derive much benefit from your past field records.

The Homestead system can produce seven distinct reports. The Profit and Loss by Field and Profit and Loss by Crop reports list the value and amount of production and the variable and fixed costs, sorted by either field number or by crop number. All values are given in terms of amount, amount per acre, cost per acre, and total cost. Total production, "variable" costs, "fixed" costs, and profits are calculated.

The Harvest report lists the amount of production and value of the crop yield for the selected fields. The amounts and values are given on a total and a per acre basis. A grand total of all values is calculated for the fields selected.

The Variable Cost Report and Fixed Cost Report list the entries which have been made to the expense accounts, broken down by fields in the Variable Cost Report. The amount and cost for each entry are given on a total and per acre basis, as well as a total amount and cost for all of the fields for the account in question.

The Soil Analysis Report and the Field History Report simply recall verbatim the same information that was entered for the year selected.

Homestead Farm Management System
Dairy Herd Management System

Homestead Computer Services Ltd.
2979 Pembina Highway
Winnipeg, Manitoba
R3T 2H5
(800) 665-8825
(204) 261-7640

The Homestead Dairy package effectively, simply and easily organizes the many records which must be maintained by the dairy herd manager. While it does not contain all of the features that competing programs do, it is better organized and easier to use than most. The program acts as a herd calendar and record book and can maintain a semen inventory. Daily milkings are not recorded, instead the results of specific testings are used. The program does not deal with feeding or with cost and income recording.

FRIENDLINESS

The Homestead manual is the weak point of the system. It is easy to read and understand and explains the system well, however it is poorly organized. The approximately 50 pages of documentation are presented as one long chunk of text. The introduction, installation instructions and descriptions of the commands available are lumped together without any dividers, borders or emphasized text to separate them. Most of the manual is made up of descriptions of each of the commands available on the menus, followed by an example of the menu itself. This seems backward; you end up confused from trying to understand the descriptions of the menu without having yet seen the menu itself. The many sample screens which are included in the manual are not distinguished from the remainder of the text in any way, further adding to the confusion. The manual does not have a table of contents or an index, probably because it hasn't any page numbers either! Despite these problems, the documentation is still better than most as a result of its clear, easy to understand (but often too brief) instructions. But better organization, use of different typestyles for emphasis, and inclusion of an index and quick reference section would easily make this an exceptional manual. As it stands now trying to find help on a specific item is almost impossible.

Error correction with the program is very easy. The number of keystrokes required is kept to a minimum, and input is very easily corrected before being accepted by the program. The disk records may be adjusted directly at any time.

The program is entirely menu driven, in fact even the input screens were very menu-like in their operation. All of the menus were kept reasonably short and well organized. There was no provision to by-pass menu levels. No on-line help was provided, and the error messages were sparse and not very descriptive. The menus used letters of the alphabet to control their operation, but the characters selected were not mnemonic.

SECURITY

The program was generally tolerant of keyboard errors, but could be made to fail with certain combinations of input. Specifically, the program stopped and had to be returned to the operating system prompt with a "floating point overflow" error when the attempt was made to display the milk test results for a cow without having set the freshening date for the current lactation. While this situation would not arise normally, it is significant that the program could not intercept the error and correct it on its own. The program could detect missing files, but would proceed anyway without forcing the operator to correct the problem. An off-line printer locked up the system without any warning being issued.

Input was checked for reasonableness where possible. One of the nice features of this program is its handling of dates; a date may be entered in almost any form (e.g. 7/19/84, 19jul84, and July 19, 1984 are all acceptable) and the program will accept it, convert to a standard form and then check that it is sensible.

The program has no built-in provisions for data backup. The program files on the version tested were not copy protected. A password system was not included with the program tested, but is available if required.

INPUT OF DATA

Editing of input was easy and quick; the entire program has been designed to keep keystrokes to a minimum. Each input item of every screen is identified with a single character. If information is required for all the items, then the program leads you through each one in turn when you first enter the screen. After the initial entry of each item (if required) you can either change any of the items on the screen by entering the character which labels it, cancel the input screen completely, or save the contents of the screen and continue with the program. If the item which needs to be changed can have only one of a small number of different values (e.g., the field "Vet-Check all open cows?" can only have a "Yes" or "No" response) then pressing the key which identifies that field automatically gives the item one of the other possible values; no other input is necessary. This system is used for the entire program and makes getting correct data into the program very easy. The only complaint which could be made is that the method used to return to the previous menu is inconsistent; sometimes the escape key will perform this function, other times it will not. The program supports use of both upper and lower case characters.

OUTPUT OF DATA

All reports produced by the program were available on either the display or the printer, except for those few which were restricted by either their width or format. The output could not be sent to a disk file. Each report was headed by the date, report title, farm name and a page number. The reports were consistent with one another, well laid out and easy to use, making good use of column headings, descriptions and borders.

EFFICIENCY

The program was very quick in operation. It was evaluated on an IBM PC with both the programs and data on a hard drive, so operation may be somewhat slower on those computers where floppy disks are used. No substantial delays were encountered during testing.

INTEGRATION

The Dairy package seems to be even further isolated from the other Homestead programs than the other physical record-keeping programs they supply, if that is possible. The program cannot share or utilize the data of any other software, and its data files are too numerous and complicated to make user access feasible.

HARDWARE REQUIREMENTS

The Homestead Dairy program is available on all computers which support the CP/M, CP/M-86, MS-DOS and MP/M-86 operating systems and which have a minimum 64k ram, two 500k disk drives and an 80 column printer. The system was evaluated on an IBM-PC with a hard disk drive using the PC-DOS operating system. (Hard disks will be necessary with both IBM and Apple computers because of floppy disk capacity restrictions.) The manual states that when operated under the MP/M operating system, the program can support multiple terminals and users at one time; a feature that would be very useful to the larger dairy operation if it actually works.

The sample program evaluated was shipped with exactly three cryptic lines of installation instructions; it took a phone call and much digging through the DOS manual to get the program up and running. In most cases however, Homestead will install the program for you so this should not be a problem, however, note that setting up a new system is not a trivial matter.

MAINTENANCE

Homestead supports its programs well. A one-day training session is provided with each system purchased. The supplier was easily contacted by telephone and was very helpful. Updates to Homestead programs are generally supplied to purchasers at no cost.

The Homestead Dairy Program has been written using a compiled language of some sort, and since the source code has not been provided it is not modifiable by the user. The manual states that the program uses an "Application Control System" which is a "user-definable 'shell' of menu and program controls" that allows customization of the operation of the major menus of the program. No documentation for this feature was supplied, so it is assumed that what this system allows you to do is control much of the program's operation by editing special "menu" text files without having to change the program itself. If that is the case, then given the proper manuals, some user customization of the program may be possible. The data files used are too numerous and complicated to be accessed directly by other programs.

LICENCE REQUIREMENTS

The purchaser is licenced to use the program on a single machine only and the programs may be copied only for backup purposes. The licence may be transferred to another party providing the original owner does not retain any copies of the software. Homestead's liability is limited to the replacement of any defective diskettes.

CAPACITY

The capacity of the program is only limited by the disk storage which is available. Because of this, absolute limits of the program's capacity cannot be given. The sample set of records in the manual contained records for a "typical" 100 cow herd, and required 312k of storage. Since the files can be expanded at any time this program should have sufficient capacity for any dairy operation when a hard disk is used.

COST

The dairy herd management program, including initial data entry and training, costs $2,500.

SYSTEM ORGANIZATION

The Homestead Dairy program has been designed so that many important aspects of the program's operation can be modified by the operator. The method used to measure milk leukocyte levels (i.e. somatic cell count) and the milk solids measurement are user defined. The program can monitor 10 different health and reproduction events in the herd; whether or not they are actually monitored in your system and the parameters used in the monitoring are set by the operator. All of the other management parameters required by the program (e.g. days after being moved to bull for pregnancy check, days fresh to show on the heat-due list, etc.) are also user defined.

The Homestead dairy system is the only program I have yet encountered which makes any provision for the storage of data for animals which are no longer in the herd. As cows are removed (either sold or died) their records are changed from "active" to "archive" status. Provision is made to allow for the storage of the archived cattle on a separate data disk from the active herd, though it appears that only one archive disk is provided. The ability to use the data stored for previous generations of cattle is a very important feature for anyone trying to increase production through breeding and/or improved herd management. This Homestead program is the only one that comes even close to supporting this important function of record-keeping.

Each cow and calf in the herd is identified with an alphanumeric identification code. The main record for each animal contains the type of animal (cow, heifer or bull), its string number or pen location, eartag number, birth date, sire and dam identity, classification score, breeder code, identity code as a calf, its current status, whether it is scheduled to be sold and a useless eight character comment. The lack of a proper comment field is particularly important because there is no provision for a name or physical description of the animal; something which is helpful in identifying individual animals and preventing errors, and very necessary for the purebred herd owner.

As each cow in the herd freshens, the date is recorded. After a user-defined number of days, the cow is flagged so that the operator can begin watching for signs of heat. For each breeding completed, the bull used, date and insemenation technician employed are recorded. After the appropriate number of days have elapsed the cow is identified as requiring a pregnancy check. When the check is performed, the date and result of the test are entered, and if pregnancy is confirmed the status of the successful breeding is updated. Until the cow is confirmed pregnant, each expected heat date is indicated.

After pregnancy has been established, the dry-off and freshening dates are estimated. As each date approaches, the cow's identity appears on the appropriate report. At dry-off, the 305 day production and total production for the lactation completed are recorded. For each calving the date, sex and identity of calves produced (singles or twins) and the bull used are entered. A comment can also be entered for each event recorded.

Production data for each animal are derived from the results of specific test days; daily milkings are not recorded. After each test has been completed, the date, number of milkings in the day, any abnormal occurrences which could be affecting the cows production, whether the animal has changed location since the last test, the total weight milked, percentage butterfat, non-fat solids measurement and the somatic cell count are recorded. The 305 day production can be estimated at any time, however the breed class average performance is not calculated. After the milking data has been recorded an exception report can be printed which lists any missing or suspect input which has been made. A listing of all the entries made in the current test can also be produced.

For recording veterinary and other health treatments, up to 30 different problem codes may be defined by the user. Whenever an animal requires treatment for something, the date, problem code, a two character user-defined code and a comment are recorded. Beside the recording of special treatments, special provision is made to record standard health operations such as uterus and ovary checks.

The Homestead program can produce many different reports. The Cow/Calf Life History report lists all of the information stored on either one, a group or all of the cows, heifers or bull calves in the herd. With the cow history, this includes the general information, lactation and breeding history, health problems, current lactation and production details, predicted 305 day production for the current lactation and an estimate of the animal's value. This estimate is made by comparing the value of the 305 day production of the animal in question to the 305 day production of the herd average and to a set of standards established by the operator. The calf history (heifer or bull calves) report is simpler, and includes only the general information and an event and treatment history.

Eight different reports deal with milk production statistics. The Herd Test Day Averages report gives the average performance of all cattle in the herd over as many as 15 previous test entries. It is broken down into figures for the entire herd, for cows in their first, second and third lactations, and for all cows with four lactations or greater. The Herd 305 Day Averages report uses a similar breakdown of the herd, but only deals with the 305 day average milk production, butterfat level and protein amount.

The Re-Cap of Entries for Last Test simply lists the input entered in the last milk test. The Change in Milk Production report lists all of the animals whose production has changed by more than a user defined minimum between the two most recent tests. For each cow selected, the identity and string number, days in milk and current status are printed, followed by the production statistics for the two most recent tests. The Production by String/Pen for Last Test report summarizes the the productivity by pen or string number. Finally the Ranking by Milk Weight, Ranking for Fat Adjusted Milk, and Ranking by SCC (Somatic Cell Count) reports sort the animals in the herd in descending order by their production as measured by the indicated value.

Ten reports are available which deal with time, resource planning and management. Most of them simply identify those animals in the herd which will require attention for a specific procedure within the next few days following the reports printing. Those reports which fall into this category are the cow heat due, cow vet check, cow due-to-freshen, calf action, heifer heat due, heifer vet check, and springer heifer (one which has been bred but not freshened) lists. The milk test barn sheet provides a form to collect milk production data. It includes a line for each cow in the herd (or just lactating cows) with the cow ID number, days in milk, and amount of production in the last test, followed by spaces to write down the weights of three milkings, and butterfat, non-fat solids, and leukocyte levels. The system can produce "pocket worksheets" which are simplified, small lists of the procedures required. They are intended to be cut down to a small size, taken to the barn for collecting observations and used as a reminder of animals requiring attention.

The Herd Management Analysis Reports summarize many aspects of herd performance. The Cow Breeding Performance Summary lists the average days to first breeding, days to repeat service, breedings per conception, days to conception, calving interval, average number of days open and total number of breedings after conception for the herd. After this the number of breedings and conceptions, conception rate, percentage of all breedings, and percentage of all conceptions is broken down by the number of services required. Finally the performance of the various technicians used is summarized.

The Average Calving Intervals report calculates the average number of months to first freshening and average number of days between subsequent freshenings for the herd. Three reports deal with health treatments which have been necessary; one simply lists all treatments of a specified problem code, another lists all treatments of a specified problem code broken down by the user defined two character code recorded with each treatment. The last report lists the number of occurrences of each problem code.

The Removal Report prints a list of all the cattle which have been removed from the herd, broken down as to the reason for removal. A Removal Frequency Summary lists the number of animals taken out of the herd for each of the reasons defined.

The Production by Sire listing summarizes the average milk production of all cows sired by each of the different bulls which have been used in the current herd. It includes actual and 305 day production figures for all animals sired by the bull in question, broken down by number of lactations completed. The Herd Inventory gives a detailed breakdown of the herd by type (cow, heifer, bull), status (fresh, bred, open, pregnant, dry) and age. The final report in this series is the Culling Rate Report, which lists the number of cows already culled and marked to be culled.

A very good user-defined report system is supplied with the Homestead program. Most of the information recorded by the program may be utilized, both as selection criteria and for inclusion in the report. Report definitions can be saved on disk for future use. Using this system, the operator will be able to obtain reports which are of specific interest to him.

Two useful additions round out the Homestead program. The To Do Reminder List allows you to keep a list of reminders and dates required, sorted in chronological order. This is used to keep track of appointments, veterinary treatments which will be necessary, etc. A Semen Inventory program maintains a list of the amount and value of semen on hand. For each bull for which semen is held the bull's registration number, breeder code, ampules on hand, value per ampule, total value, container number, first and last date used and ampules used are maintained.

Homestead Farm Management System Feedlot Record-Keeping Module

Version 2.5

Homestead Computer Services Ltd.
2979 Pembina Highway
Winnipeg, Manitoba
R3T 2H5
(800) 665-8825
(204) 261-6740

The Homestead Feedlot Record-Keeping program is an easy to use program that will provide good management records for the operator of the non-custom feedlot. The larger custom feeder will find himself limited by the lack of billing/invoicing facilities. As well as a record-keeping system, a good least-cost rations program and a "profit projector" program are included. No program failures occurred during testing.

FRIENDLINESS

Documentation for the feedlot system consisted of 45 pages in a 9 inch by 7 inch binder which contained the documentation for all of the Homestead modules. The documentation was divided into two sections, one each for the record-keeping program and the "Feedlot Simulation" program. Each section contained an introduction which outlined the functioning of the program, a start-up procedure, and a description of the functioning of each command. A set of sample reports was included with the record systems manual. No quick reference or index was supplied, but the table of contents for each section was short enough that it was easy to find the information desired. The documentation contained many illustrations, was complete, accurate and easy to understand.

On-screen error detection was sufficient, but was unnecessarily complicated by inconsistent use of the various keys used for data entry. Mistakes in the permanent records were either adjusted directly or corrected via an offsetting entry.

The program was entirely menu driven; all of the menus were short and easy to use. There was no facility for by-passing menus, but none was required. Nor is there on-line documentation, but the program will display a list of available pens, lots or accounts on command. The menu commands used are numeric.

SECURITY

The program was insensitive to errors involving the keyboard, however, it failed when other problems such as a disk not ready occurred. The program could detect the insertion of an incorrect disk.

While the program checked most inputs such as dates well, it seems unreasonable that it should quite happily accept a price of $75 per pound for an animal without complaint, a typing error that obvious should be flagged in some way. Substitution of character and numeric input was handled correctly.

The program relied on the operating system for data backup, and the programs themselves were not copy protected. The system evaluated did not have password protection although it is available to those purchasers who require it.

INPUT OF DATA

Editing facilities with the program were limited but adequate. Each screen full of information was verified before it was stored, and in most cases answering no to the verification would make you re-type only the fields which were wrong. Unfortunately this too varied from screen to screen, sometimes you had to re-enter an entire screen in order to correct a mistake in a single field. In general, the input forms were easy to use and uniform in layout.

OUTPUT OF DATA

The reports were generally well laid out and easy to read. Each report from the record-keeping program was headed with the name of the report and the date of printing. Indentation and use of all capitals made the reports easy to understand and interpret. All reports were available on the display or on the printer, but none could be sent to disk.

EFFICIENCY

The program was sufficiently quick in most cases, but some screens suffered irritating delays while the lower section of the screen was repeatedly and unnecessarily cleared. Report generation was very quick.

INTEGRATION

Neither feedlot program would interface with any of the other modules of the Homestead system, except that it was possible to enter the inventory system from the record-keeping program directly without returning to the main menu. Since there is no technical documentation supplied, it would not be possible for non-Homestead programs to access the data files maintained by the system.

HARDWARE REQUIREMENTS

The Homestead system requires an IBM PC, IBM compatible, or Vector 4 computer with two double-sided (320k) drives and a printer capable of 132 column condensed print. A hard disk version of the program is also available.

MAINTENANCE

No technical documentation is supplied with the system which would be of use to the programmer. Homestead has several dealers in Alberta, so that the purchaser of their programs is assured of reliable assistance which is quickly available. Homestead provides a one-day on-site training session with all of their systems. The program has been written using a BASIC compiler, however, since the source code is not supplied it cannot be modified by the end user. Homestead does customize programs for individuals.

LICENCE REQUIREMENTS

The Homestead program is licenced for use on a single CPU only and may be reproduced for the purposes of backup. The licence may be transferred (sold) provided that the seller destroys or transfers all copies. The diskettes on which the program is distributed is warranted for 90 days, otherwise the vendor disclaims all liability.

CAPACITY

The program can handle up to 270 pens and 270 lots, each of which can contain any number (less than 65536) of cattle. Up to 270 expense accounts can be maintained, with no upper limit on the number of transactions in each account. Limitations of disk space will probably occur before any of these other restrictions come into effect.

COST

The Homestead Farm Management System Feedlot Module costs $1,000; $750 for the record-keeping program and $250 for the simulation module.

SYSTEM ORGANIZATION

Animals are not tracked individually by the Homestead system, but are organized into the usual lots and pens. Each lot can contain up to 30 sub-lots, each of which can contain any number of animals. Once organized into lots, the animals are distributed among pens, which are also organized into major and sub groups. Animals from a single lot can be distributed among any number of pens. While it may sound confusing, this system does provide an easy way to keep track of the inventory of a feedlot while not restricting the options available to the manager.

For each main lot the system maintains a 20 character description. For each sub-lot a purchase date, number of head, weight and price is maintained as well as a description. Only a description is maintained for each pen, therefore since a pen capacity isn't recorded, it will be up to the operator to spot over-crowded or under-utilized pens. Each time an animal is moved into or out of the feedlot, or from one pen to another the date, lot, source and destination are recorded.

Feed costs and other costs are tracked separately. Tracking feed costs begins with the definition of a series of up to 30 ingredients. For each ingredient, a description, unit of measure and cost per unit are recorded. The ingredients which have been defined are then used to create up to 30 rations. For each ration a description and unit of measure are recorded, as well as a series of ingredients. From the amount and price of each ingredient included in the ration, a price per unit ration is calculated which can be adjusted by the operator in order to include handling charges, mark-up, etc. Feedings can be recorded for specific lots and pens or for a series of pens and lots. When a feeding is recorded for more than a single pen and lot, the expense is automatically distributed based on the number of head and days in the feedlot.

In order to record expenses other than feed it is necessary to set up a list of expense accounts. These expenses may be distributed among one or a series of lots and pens in the same way that feed expenses may be.

The program's main shortcoming which would hamper its use by a custom feeder is its lack of a suitable billing report. While it would be fairly straightforward to write up an invoice from the information supplied by the system, it would require the running off of several separate reports and then collecting data from them. A custom feedlot operation would require the inclusion of a report which would detail all the expenses both feed and non-feed which have occurred for a lot, something which this system lacks.

The Animal Movement Reports list the transfers of cattle into and out of a pen or a group of pens. It gives the date, lot, source, destination and number of head moved for each transfer.

The Lot or Pen Status Reports lists a summary of all the information entered concerning a specific lot or pen. The Lot Status Report gives the purchase date, the number of head purchased, sold, dead and the accumulated animal days. The total weight and price, average weight per animal, and price per pound are given for both the initial purchase and any sales which have occurred. Finally the pen disbursement of the animals in the lot and the costs to date are listed. The Pen Status Report gives the total head in the pen, followed by a listing of the lots which have animals in the pen. For each lot which has animals in the pen, the number of head from that lot and the costs to date are tabled.

The Expense Reports print the non-feed expenses which have been entered. The report can include all of the expenses which have been recorded, or the system can sort the entries by major or sub expense account, pen or lot number and date.

There are three separate reports under the classification of Feed Ration Reports. The Feed Ration Consumption Report operates similarly to the Expense Report, except that feed expenses are listed. It can include all feed expenses entered or can be sorted by ration type, pen or lot number and date. The Inventory Impact Report lists the changes in inventory which have occurred since the last inventory update was completed. Finally, the Ration Composition Report gives the ingredients of any or all of the rations which the operator has formulated.

The Profit and Loss by Lot Report is available in an interim and a close out version. The interim report gives a detailed expense to date breakdown and the sales and deaths to date, from which it calculates a break even price. The close out version of the report produces a single page summary of the performance and profitability of the lot, including the calculation of performance measures too numerous to go into detail with. This report, which is produced whenever a lot of cattle is closed out, provides an excellent measure of the performance and profitability of the feedlot and would be a very useful management tool.

The Feedlot Simulation Module operates independently of the other parts of the Homestead system. It includes a least-cost ration calculator, and a set of profit projection calculations.

The Least-Cost Feed Formulation program balances digestible energy, protein, calcium and phosphorous requirements. The program is flexible, allowing you to adjust all aspects of the calculation. The program is fast; even though it warns that the actual balancing may take up to three minutes, none of the runs tested took more than 10 seconds. The system contains pre-defined parameters for 28 different feeds, one of which may be user defined. The nutritional values of all feeds may be adjusted by the user. This is probably one of the better ration formulation programs available.

The Profit Projection program performs four simple calculations to estimate potential feedlot performance. While these programs are adequate since they do not use the data already stored in other parts of the system as a basis for their estimations, they have no advantage over using a spreadsheet for the same kind of calculations and are probably more difficult to use.

Marshalls Dairy Management 5-S

Countryside Data
4013 Nipigon Road
Lethbridge, Alberta
T1K 4P8
(403) 320-0782

The Marshall Dairy Management program will provide its user with all the functions necessary for the basic management of a dairy herd. As well as breeding and performance data, the system can also track feed and other costs, maintain daily production records, keep a record of health treatments completed and even includes mailing list and ration balancing programs. The program leaves much to be desired in its organization and layout; it is hard to use and understand in places and tends to overwhelm the user with unnecessary detail. Many areas of the program's operation could be refined.

FRIENDLINESS

The program's manual contains only a two page "getting started" section, followed by individual descriptions for each of the selections on the main menu. No tutorial, index or quick reference section is provided, but a fairly comprehensive table of contents is included. The 82 pages of documentation supplied with the program are mounted in a three-ring binder with the material for the other Countryside programs. The manual is not detailed enough and poorly written. It has been reproduced with a poor-quality photocopier. While most of it is readable, several pages have been copied from a poor-quality condensed print, dot matrix original. As a result reading it is difficult. While the IBM version of the program was tested, the manual was reproduced from the TRS-80 model II version, as a result all of the references to the computer and operating system were incorrect. Altogether the manual is so poor as to be nearly useless.

Error correction with the program is very poor. On-screen editing is almost non-existent. Contents of the disk files are adjusted directly for correction. The program is entirely menu driven. A large main menu and several sub menus are used to organize the system well. Many of the menus contain entries which are labeled "BLANK", which are "reserved for future expansion" and return you to the same menu if selected. I can't see why these entries should be necessary, they tend to clutter the menus and make them harder to use.

Some limited on-line help is provided with the program. Entering "H" alone into the data fields of the main input screen causes a brief one or two line help message to be printed at the bottom of the display which helps explain what is required for that item. The menu selection commands used are all numeric.

SECURITY

The Marshall program contains the crudest error handling procedure I have yet seen. Program errors are not detected by the system, instead, if a problem occurs the user is told to use the break key to stop the program and then re-start it by entering "GOTO 500" OR "RUN"! The manual claims it is impossible to corrupt the data files using this method, but dumping the inexperienced computer user at the command level of the interpreter is an invitation to disaster.

Input checking is good, but could be improved. Many of the input items have pre-defined limits which cannot be exceeded, thus preventing many gross mistakes. Dates are verified correct (i.e. proper number of days in month, etc.) but are not checked against other dates available for reasonableness, (e.g. it is possible to record a breeding date for an animal which occurred before its birth date). Substitution of numeric and character data is handled well.

No data backup facilities are provided. The programs on the system tested are not copy protected, but are access protected. No password protection scheme is used.

INPUT OF DATA

On-screen data entry is inconsistent and not refined. On most of the screens entering "B" into a data entry field allows you to re-enter the previous input, otherwise no editing features are provided. One of the input screens for the ration balancing program actually prompts you to use the break key to stop the program and then re-start it if you make a mistake. The input screens tend to be overcrowded and poorly explained, and vary in use and layout from one section of the program to another. The program allows the use of lower case characters only in the names of the cows.

OUTPUT OF DATA

Most of the reports issued by the system are headed by the name of the report and the date printed. The column headings and identifications used are sufficient, but are abbreviated too often. In general the reports are easy to use and interpret; good use is made of various type sizes and borders to organize them. Most of the reports are available on the printer only: the exception, the Quick Summary report, is produced on the display with the option of printing it onto paper. There is no provision to route output to a disk file.

EFFICIENCY

The program was quick in operation. The software was evaluated using a IBM-PC with dual floppy disk drives, and no significant delays were observed.

INTEGRATION

The Marshall program has not been designed to co-operate with any other software. The format of the disk files is not provided and on examination, it appears unlikely that it would be possible to access them with a user-written program.

HARDWARE REQUIREMENTS

Countryside Data can supply the Marshall program for a wide variety of computers, including the Apple II, IBM PC, and TRS-80 models. However, unlike the other products they supply, the CP/M operating system is not used with the Marshall program, rather the program is used with the "standard" operating system of the computer (Apple Dos, PC DOS, TRSDOS, etc.) as appropriate. This could cause problems, especially for hard disk users, resulting from having to use two operating systems on the same machine. This situation could also necessitate having to learn how to use two different operating systems if more than one Countryside program is purchased. It would be preferable if all the programs used the same operating system when possible.

MAINTENANCE

The Alberta distributor for Countryside Data has been in business for several years, and though somewhat difficult to get hold of was very knowledgeable and helpful when contacted with a problem. A phone number is supplied with the program to contact the U.S. manufacturer directly if required.

The program as tested had been implemented using the BASIC interpreter supplied with the IBM-PC. However, the program is access protected so that the user could load and run the various programs of the system, but not list or modify them. While with this system the slowness of interpreter doesn't seem to affect the operating speed greatly, it is expecting a lot for the user to put up with the non-modifiability of a compiled system and the slowness of an interpreted program at the same time.

LICENCE REQUIREMENTS

No formal licencing agreement was supplied with the program.

CAPACITY

The size of herd which may be maintained by the Marshall program depends on the amount of disk capacity available. As an estimate, the dealer recommends approximately 1K of disk storage for each cow to be maintained.

COST

The program sells for $1,150.

SYSTEM ORGANIZATION

Each cow in the herd is identified with an all numeric tag number. A 13 character name is stored for each cow, a "string" number (used to divide the herd into separate groups), a birth date, total weight and a "source code" which indicates where the animal came from. A physical description of the animal, its NIP or purebred registration number, sire or dam are not maintained.

The program maintains five dates dealing with the breeding cycle for each animal: the date freshened, last bred, dried off, first day milked after calving and last heat date. The number of times bred, bull used for the most recent insemination, pregnancy status and result of the calving (number and sex of calves, calving ease) are maintained for the current lactation only.

Given the freshening date, the program will calculate the recommended dry off and rebreeding date for the animal. After the initial breeding, the program will flag all animals which require pregnancy checks. Once pregnancy is confirmed, the most likely calving date is calculated. The interval between freshening and first breeding and between insemination and pregnancy check are user defined; the other time periods are pre-set and cannot be modified.

Numerous milking performance data are maintained for each cow, recorded on a daily production basis as opposed to using the results of a single test day. For each animal the last milk weighing recorded, total production for current lactation and lifetime, fat percentage, total fat for current lactation and lifetime, 305 day mature equivalent, somatic cell count, protein and lactose percentages, and non-fat solids level are recorded. Breed class averages are not calculated.

The herd is divided into strings and groups. The string number for each animal is user defined, and is used to divide the dairy into sub herds as the manager sees fit. The group classification is assigned by the program and is dependent upon the production of the animal. Group numbers one to five are reserved for lactating cows, with group one having the highest production and group five the lowest. The production levels required for each group number are user assigned. Group six is dry cows, group seven consists of springing heifers.

A Milk Work Sheet is provided for the collection of milking data. The tag numbers for animals within specific or all groups and strings are printed four wide on a sheet with a small space provided to write down three words about each cow. The room provided on the form is probably sufficient but doesn't allow for any extra information or comments to be collected.

Milk data are collected on a cow-by-cow basis in the same order as entered into the worksheet. Milk data can be recorded one, two or three times a day. While recording the current milking, the previous milking weight is displayed so that errors or large changes in milkings may be noticed. Fat and protein percentages and somatic cell counts are prompted for each time milk data are recorded but do not have to be entered.

Feed costs for each animal are estimated from the production of the animal. The user sets the projected cost per day to feed a cow producing 30, 40, 50, 60, 70, 80, 90, 100, 110 pounds of milk a day, or is dry. From this value the program will estimate the feed costs for each animal for the current lactation and for its lifetime. Similarly the income for each animal is calculated from a user estimate of the value of the milk sold and the fat dockage.

Herd health records in this program are divided into those dealing with mastitis treatments and those dealing with other health problems. The number of treatments, type of treatment and type of mastitis are recorded for all four quarters of each cow. The details of only the most recent mastitis treatment are maintained, but the cost of each treatment is entered as part of the total lifetime cost of the animal. All of the information concerning the type and treatments is encoded with one and two digit numbers, and since the program cannot call up a list of code meanings while entering data you will need to have an up-to-date list handy to decode the system, a disadvantage.

Other health procedures are recorded in a similar manner. The only difference is the provision of a work schedule which lists all of the routine health treatments required within a user-defined time frame. All of the routine health checks, and the days before or after freshening that they must be performed are user-defined.

Eighteen different reports are produced by the Marshall program. The Cow History lists all of the information stored for a specific animal, including breeding, health, performance, mastitis, cost and income data.

The Dry Cows, Heifers, Lactating Cows and Cows in X Group reports list all of the animals which are in a specific group or range of groups. For each animal selected the name, tag number, last milk entries, breeding information, lactations completed, 305 day mature equivalent, somatic cell count, days lactating and open, date freshened, inseminated, suggested to dry off and expected to freshen are listed.

Seven reports deal with breeding and the lactation cycle. Given a number of days after insemination, the Pregnancy Check report lists all animals which have been bred but have not yet been confirmed pregnant. The Cows Confirmed Bred and the Cows Inseminated Not Confirmed reports give all those animals in a string which fall into those categories. The Cows Not Inseminated X Days Past Freshening and the Cows Open Over X Days Past Freshening each use a number of days (X) to identify the cows requiring attention. For each cow listed in any of these reports, a line of information is printed which includes the name and tag number of the cow, followed by other information applicable to the report at hand.

The Quick Cow Count totals the number of animals in each string and group. It takes the form of a three by nine matrix, with the various group numbers and herd totals across the top and the three string numbers running vertically. This grid is filled in with the number of animals in each category.

The One Line History report prints a summary of the information stored for the entire herd or for a specific animal. Each line in the listing includes the same information as is provided in the listings by group number.

The Cows Over/Under X Milk listing gives all animals whose production falls within a specified range.

Three reports deal with work scheduling and time management. The Cows Due to Freshen and the Cows Due to Dry Off reports print an entry for all animals which are due for one or the other operation within a specified number of days. The Work Schedule provides a summary of all the routine jobs that will have to be performed within a number of days specified by the user. Each time the report is run the operator enters the group or groups to be used, the string number, the days past freshening before the first breeding, and the days past insemination before the first pregnancy check. The program will print the tag number and date required for each drying off, freshening, breeding, and pregnancy check that will be required. Some supplementary information is also provided in the report for the breeding and pregnancy checks.

The Complete Herd Averages Report lists the average value of all information stored for the herd, broken down for springing heifers, cows which are dry, lactating and not bred; lactating, bred but not confirmed pregnant, and lactating and confirmed bred. Some of the values produced in this report are meaningless; for example the average calf codes are printed. A four digit code is used to record the results of each calving, e.g. the code 1002 indicates an animal which had one bull calf, no heifer calves, a miscellaneous code of zero and a calving difficulty of two. Averaging this number for a group of animals is meaningless, but that is exactly what this program does.

The second page of the Herd Averages report begins with a chart which gives the predicted number of animals in each stage of the lactation cycle for the next 12 months. This report would be very useful for locating potential shortages or surpluses which may be approaching, but would be improved if it included an estimate of total production which could be expected from those cows which will be lactating. This chart is followed by a printout of the user set values for feed costs and milk prices, and a total of the number of animals in each group.

The final report available from the system is the output of the Super Sort and Speed Sort programs. The Super Sort program allows you to choose one of the items of information stored for each animal as a selection and sorting criterion, whether to have the information sorted in ascending or descending order, and to decide whether cows with a zero or blank value are included. The program then lists all of the animals in the herd which meet the criteria, sorted as to the value chosen.

For each cow the tag and group number, the value of the sorted field and the value of three other user selected fields are printed. This system will allow you to produce many different and useful reports, and would be particularly handy when making culling decisions. The Speed Sort program is similar, except that only six pre-defined sorts are provided; by name, milk weight, fat percentage, protein content, somatic cell count or group number.

The program can print a graph, called the "M.R.B. Dairy Herd Graph" but because it is not mentioned in the manual, it is impossible to make any useful comments about it.

In addition to the record-keeping function, the Marshall system contains a mailing list program and a ration balancer. The mailing list program is simple, it provides storage for a company or contact name, a four line address, phone number, and a user defined category number. The addresses may be printed either on labels or several across on paper for filing. Addresses may be searched for by either name or postal code. The other parts of this system do not use the address files in any way, so there is no advantage to using this program over any other mailing list manager.

Two ration balancing programs were supplied with the system evaluated, a "Ration Balancing T/E" (I assume T/E stands for Trial and Error) and "Deluxe Ration Balancing". Considering the complexity of both programs, and the claim in the introductory screen to the deluxe program that it is the "World's Best", neither program showed much sophistication — neither was a least-cost ration balancer. Once the user sets either the desired amount or ratio of roughages the program will calculate the amounts of user selected energy and protein sources required to balance the feed. The only difference between the two programs is that while the deluxe program would complete this process automatically, the T/E program requires that you manually adjust feed levels to obtain the balance. The major complaint with the program is its poor documentation. With something as important as setting up a dairy ration it is vital that the user understand exactly how the answer is arrived at, which is not explained with this program. It would be unwise to depend on the results of the Marshall program without first testing it carefully and comparing its recommendations against your current feeding methods.

Solutions Cattle Administration Program

Version 1.96V

Solutions
850 Erin Place
Edmonton, Alberta
T5T 1M6
(403) 481-1673

The Solutions program is a comprehensive record-keeping program for the custom feedlot operator that should be able to handle almost any situation which could arise in such an operation. While potentially an excellent feedlot management program, it will need more development. It is difficult to use and understand in places and its reports could use some improvement in their formatting.

FRIENDLINESS

Two versions of the manual for this program were reviewed. When the program was initially examined, the manual supplied was so poor as to be nearly useless. Before the final evaluation was done a new version of the manual was completed, which is a great improvement over the earlier version. The manual now consists of 42 pages of dot matrix printed text. It includes a command-by-command description of each of the menu selections available in the two parts of the program. A brief (one page) introduction is included, as well as appendices for setting up a new system, making backups, describing the on-screen editing system and the error handling procedure, a set of commonly asked questions and answers, and a glossary. No index, tutorial or quick reference section is provided, but a brief table of contents is included. The detailed descriptions of each command are hard to understand without a tutorial section or an overview of the program's operation; it is hoped this omission will be made up for by the initial training session supplied with the program.

Correcting errors with the program is adequate. Mistakes in the disk files can usually be adjusted directly, but in some cases an offsetting entry is required. The program is entirely menu driven, and though several different styles of menu are used they are generally easy to use. There is no method of bypassing menu levels, but none is required. No on-line help is supplied, but the program employs numerous helpful reminders and has good error messages. The commands used are generally mnemonic, but some numeric commands are used also.

SECURITY

The program was sensitive to errors resulting from operator input. If the break key was pressed the program halted, but could be restarted without loss of data by entering "cont". At one point, entering a very long description for an expense category caused the program to fail completely so that it had to be started from the beginning.

When a major error with this program occurs, three things happen. A message is flashed on the screen requesting that you check the manual, a log of the type, date and location of the error is made on the disk, and the program returns to the main menu of the section you are in. There are 10 different procedures in the manual, one of which you are supposed to follow when an error occurs depending upon which section of the program you were in when the problem arose. While this method of dealing with program failure is more comprehensive and probably more reliable than most, it is also quite involved and considering how prone this program seems to be to errors, it could be a problem when the system is heavily used. A disk drive not ready or the use of the wrong disk is handled well but an off-line printer is not detected; the program simply waited without notice until the printer is placed on-line again.

Input verification with the program is excellent. When the user gives the month, year and date, the program determines the day of the week, so if there is a mistake made it will be noticed immediately. When giving feed to the animals, the program prints a warning when more than 28 pounds per animal per day have been given as a value. These are just two examples of the many places where the program uses information available to it to try to eliminate errors. Substitution of character and numeric data is handled well. The program uses a batch execution file to perform data backups so that minimal input is needed on the part of the operator to perform the required operations. The programs are not copy or access protected; no password system is provided.

INPUT OF DATA

Editing facilities with the program are limited. There is no method of returning to previous input fields after they have been entered. Most screens require verification, and if a field is wrong the program simply runs through the input on the screen again. However, since pressing the enter key alone causes the previous value of the field to be used again, you only have to re-enter the fields in which there is a mistake. The program supports use of both upper and lower case, but the developer suggests the use of upper case only. The input forms vary widely in size, organization, layout, method and ease of use, but none are particularly difficult to understand.

OUTPUT OF DATA

The reports generated by the program vary greatly in quality of layout and ease of use. Some make good use of the different sizes of print available, are well laid out and easy to understand. Others lack proper headers or explanations and are difficult to identify, let alone interpret. The program is inconsistent with regard to form feeding; some reports are automatically followed by form feeds while others require that you advance the printer manually otherwise the next report printed will not be properly aligned on a page. The reports generally use 80 column output, but most are restricted to the printer only. A few give the option of being sent to the printer or the display, but others are available only on the display. None of the reports are available on disk file.

EFFICIENCY

The Solutions program is fairly quick when inputting data or printing reports, but slow moving from one part of the system to another. When using the program, it is necessary to carefully plan operation to avoid becoming frustrated while waiting for the system to move from one menu to another. Performance of the program would probably be improved if a compiled version was used, rather than the BASIC interpreted version which was evaluated.

INTEGRATION

The Solutions program is not designed to share its data with any other system. Since the source code is available to the user, it would probably be possible to figure out the format of the disk files so that they could be accessed with a user written program.

HARDWARE REQUIREMENTS

Since the program is sold directly by the developer it could be adapted to a wide range of different computers. The minimum requirement would be some form of disk storage, printer and a BASIC compiler or interpreter. The system was evaluated on a TRS-80 model II with a single disk drive and an Epson mx-100 printer, using the CP/M operating system and MBASIC interpreter which proved more than sufficient for the requirements of the program. The Solutions program would be a good choice for someone with out of the ordinary hardware who was having difficulty finding software. A special version for the IBM-PC is available.

MAINTENANCE

No technical documentation is supplied with the program. The Solutions program has been developed and is being sold by Art Rutledge of Edmonton, Alberta. Rather than selling a pre-packaged program, Art specializes in customized applications depending on the customer's requirements. This kind of personalized approach ensures that the customer will get the maximum utilization from his purchase, and is perhaps the best method of obtaining software for the operator who can justify the time and money required. Installation on your particular computer is included with the sale of each program, approximately one day of training and assistance with initializing your system, approximately four to five hours worth of custom programming and a follow up visit one week after the initial set-up. The program evaluated was assembled as a typical installation, but may differ from a possible set-up for your particular operation.

The version of the Solutions program evaluated was written using the BASIC language. If used with an interpreter, this means that the source code will be available and could be modified. The purchase of the programs generally include some limited modification to the customer's specifications.

LICENCE REQUIREMENTS

A copyright notice for the manual alone was included in the new version of the documentation, but no formal licence agreement for the software was provided.

CAPACITY

The capacity of the program is determined solely by the disk facilities available. For example, a standard IBM PC configuration would be able to handle 450 to 500 pens, while an Apple II would be able to record 30 to 35 pens.

COST

The Solutions Cattle Administration program as tested, including installation, training and some customization (approximately four to five hours worth), would cost $1,890, $1,495 without the expensing module. A less expensive, simpler version of the program without the installation, training and customization is also available for $495.

SYSTEM ORGANIZATION

The Solutions program uses the standard lot and pen organization common to most feedlots. Ownership of any lot may be distributed among a number of buyers, with each owner's share of income and expenses based on an operator defined percentage. An excellent feature of the Solutions program is that all of the lots, feed ingredients and rations, and expense items are identified by name rather than by number, and you can use any portion of the name you require to identify what you want. For example, if you need to enter the expense item BOVAID EAR TAGS into the program, entering BOVAID, TAGS, or even BOV will correctly identify it. This simplifies operation of the program, since you can use names which are meaningful to you in data input.

Each time cattle are added to a lot the number of head, sex, total cost, gross and after shipping weight are recorded. From these inputs the average in-lot and gross weight per animal are determined. After giving the program the desired final weight, estimated rate of gain and a desired cost per pound gain, the program will calculate a finishing date and a break-even price.

As each group of animals enters or leaves the feedlot, a one page report is printed which summarizes the operation. The report is headed as if it were intended to be given to the lot owner when cattle from the lot are sold, however, the same header is used regardless of whether the cattle were sold, died or purchased. The report describes the lot, average, gross and net weights, shrink, price sold at and any deductions from the cheque.

Animals from a specific lot may be distributed among any number of pens. No maximum pen capacity is recorded, therefore, it is up to the operator to check for overcrowded pens.

The program allows the definition of a number of ingredients, from which a set of rations can be assembled. For each ingredient a description, cost per unit measure and percentage dry matter are recorded. Each ration can be made up from up to nine different ingredients, the amount of each ingredient in the ration being measured as a percentage by weight. The rations are priced automatically, based on the costs of the ingredients used, and can be adjusted independently of the costs of the original ingredients if so desired. A provision is made for five different mark-ups such as handling, processing, etc. which are added to the cost of the ingredients on either a percentage of cost or a price per unit basis. The system also includes programs to maintain an inventory of feeds and to calculate the amount of individual ingredients necessary to produce a ration, given an amount of feed per animal and the number of head to feed. Finally the program can track the amount of certain ingredients used by a lot so that an amount can be arrived at when a customer wishes to supply his own grain.

Non-feed expenses are divided into seven categories: yardage, diagnostic, bedding, processing, freight, medication and miscellaneous. The user of the program defines a number of "items", for each of which a name, unit of measure, unit cost and markup are defined. You can then charge these items to specific lots under one of the categories. The total amount charged per month for each item is recorded, as well as the amount charged under each category to each lot for the current month and the year to date.

Billing is intended to be done once a month and closes out the expense accounts, transferring the balance of the month's expenses to the yearly totals. Three documents are printed for each lot; a listing of the feedings given, a chart of expenses and a statement. For each feeding during the previous month the pen, number of head, type and amount of ration, and cost are listed. The expenses list gives the item identification, number of units received, cost per unit, total cost and the date the expense was incurred. Each statement provides a summary of animal movements into and out of the feedlot for the month, current month and year-to-date expenses under each of seven categories, the total weight, cost of feed for the month and per head, day and amount due. The amount due is broken down into the share owed by each partner for shared ownership lots. Each statement has a header which implies that it is intended to be sent to the customer directly, but since it does not have the address of the customer or an invoice number, and because the program doesn't have an accounts receivable function, it probably wouldn't be sufficient for many users. Most would end up having to transfer the information in the billing report onto some sort of pre-printed form and into whatever method they use to keep track of their receivables. After all of the bills have been printed a month-end feed, expense and animal movement summary is printed.

A close out report may be produced for a lot at any time, but if all of the cattle in the lot have been sold out of it when the report is generated, the system will eliminate the lot completely after the report is done. The close out gives a summary of the performance and profitability of the lot, and includes 25 entries which give such things as the weights in and out of the lot, gain, costs, averages of performance, etc.

APPENDIX — Glossary

While this report has been written presuming a basic familiarity with computer terms definitions of a few of the more specialized terms may be useful.

ACCESS PROTECTION: In cases where a computer program could possibly be modified by the end user, the manufacturer may take steps to prevent such modification. This includes systems which clear memory when trying to list the program, compressing or encoding the program to make it unreadable, or any of a number of other methods. While a perfect access protection scheme has yet to be invented, they usually prevent the average user from gaining access to the program.

BACKUPS: Good microcomputer operation requires that extra copies be made of all records after each significant change, since the cost of re-entering even small amounts of data far outweighs the cost of making extra copies. Several methods of backing up records are used, such as extra files on the main data diskette, exact copies of the data diskettes, cassette tapes, printed records or a combination of these methods.

BOOT: To boot a computer is to start it again as though you had just turned it on. The contents of the computer's memory are erased, the disk drives and printer are reset, and any work going on when the boot is started is lost. The term is derived from the phrase "pulled up by his own boot straps". Re-booting the computer is usually a last resort when some problem has arisen and nothing else seems to work. If at all possible it should be avoided.

COMPILER: There are two methods by which a computer program may be converted from words into actions. A compiler takes the program and converts it all into machine language at once, after which it may be executed by the computer. The other method is to use an interpreter.

COPY PROTECTION: In order to prevent illegitimate copying and sales of their programs, many manufacturers allow the purchaser of a program to make no copies or only a limited number and they modify the diskettes to prevent any further copies being made. This practice is becoming less common among the better programs with the realization that any copy protection system will eventually be broken and that copy protection hinders the legitimate user from getting maximum use of the programs.

CONFIGURE: In computer terms, to configure a program is to set up its internal characteristics so that it will work with a specific computer system or peripheral.

CP/M-80 OR CP/M-86: Control Program for Microcomputers. A popular operating system for microcomputers developed by Digital Research in California. By using CP/M, a program written on one brand of microcomputer may be easily run on another computer, providing they both use the same type of CP/M. (Programs for CP/M-80 can generally not be used with CP/M-86, and vice versa.)

IMPLEMENT: In computer terms, the process of setting up a computer system to complete a specified action or activity.

INPUT ROUTINE: The input routine is a program in the operating system or in the main program which takes the keystrokes entered by the user and converts them into a form usable by the remainder of the program.

INTERFACE: An interface is a method used to link two devices or programs which would otherwise be unable to communicate with one another.

INTERPRETER: A programming language interpreter takes the computer program, splits it into small pieces, converts each piece to machine language and executes it. As a result, portions of the program which are executed more than once must be re-interpreted each time they are encountered. Interpreted computer programs are much slower than compiled programs, but they are easier to make and cheaper to use over the short term.

MACHINE LANGUAGE: A program is in machine language when it is in a form that the computer can understand. Machine language programs are nothing but streams of numbers and as a result cannot be read by humans.

MENU: A menu in a computer program is a list of possible actions, from which the user can select one. A program which uses many menus is said to be "menu driven", and is generally easier to use but slower than other methods of controlling a computer program.

MNEMONIC: When commands or responses are given code letters so that the letters suggest what the command is about, they are said to be mnemonic. For example, if a program prompts you "Enter 1 for yes, 0 for no:" then the commands 1 and 0 are not mnemonic, while if prompted "Enter y for yes, n for no:", the commands y and n are mnemonic.

ONLINE OR ON-LINE: Something is considered to be "online" when it is ready for immediate use by the computer. Online documentation or help is assistance in operating a program which is available on the computer without having to use a manual. A printer is "online" when it is ready to accept input from the computer.

OPERATING SYSTEM: The computer program which looks after the basic operating functions of the computer and its peripherals. Usually sold with the computer, some popular operating systems which are available from software manufacturers are CP/M, MS-DOS, UCSD-p and UNIX.

PROGRAMMING LANGUAGE: The machine language used by computers cannot be read or written by humans. Many different "languages" have been developed to write computer programs which have been translated into machine language by other computer programs. These languages try to put the operations of the computer in terms the programmer can understand. Common languages for microcomputers include BASIC, PASCAL and C.

REBOOT: see Boot.

SOURCE CODE: The term for a computer program still in human readable programming language.

SYSTEM: A system in computer terms has two meanings. It refers either to a set of programs and associated data files that make up a purchased program, or it may also refer to the total combination of hardware and software that make up a single computer system.

VERSION: Computer programs are constantly undergoing improvement to correct errors. In order to identify the earlier and later versions of a program, the practice of version numbers has become standard. A newly developed program will be called version 1.0. With each minor correction or change in the program, the digit after the decimal point is changed, to version 1.1, 1.2, 1.3, etc. When a major change is made to the program (usually when the program is re-written) the digit before the decimal point is changed,i.e. version 2.0, 3.0, 4.0, etc.